PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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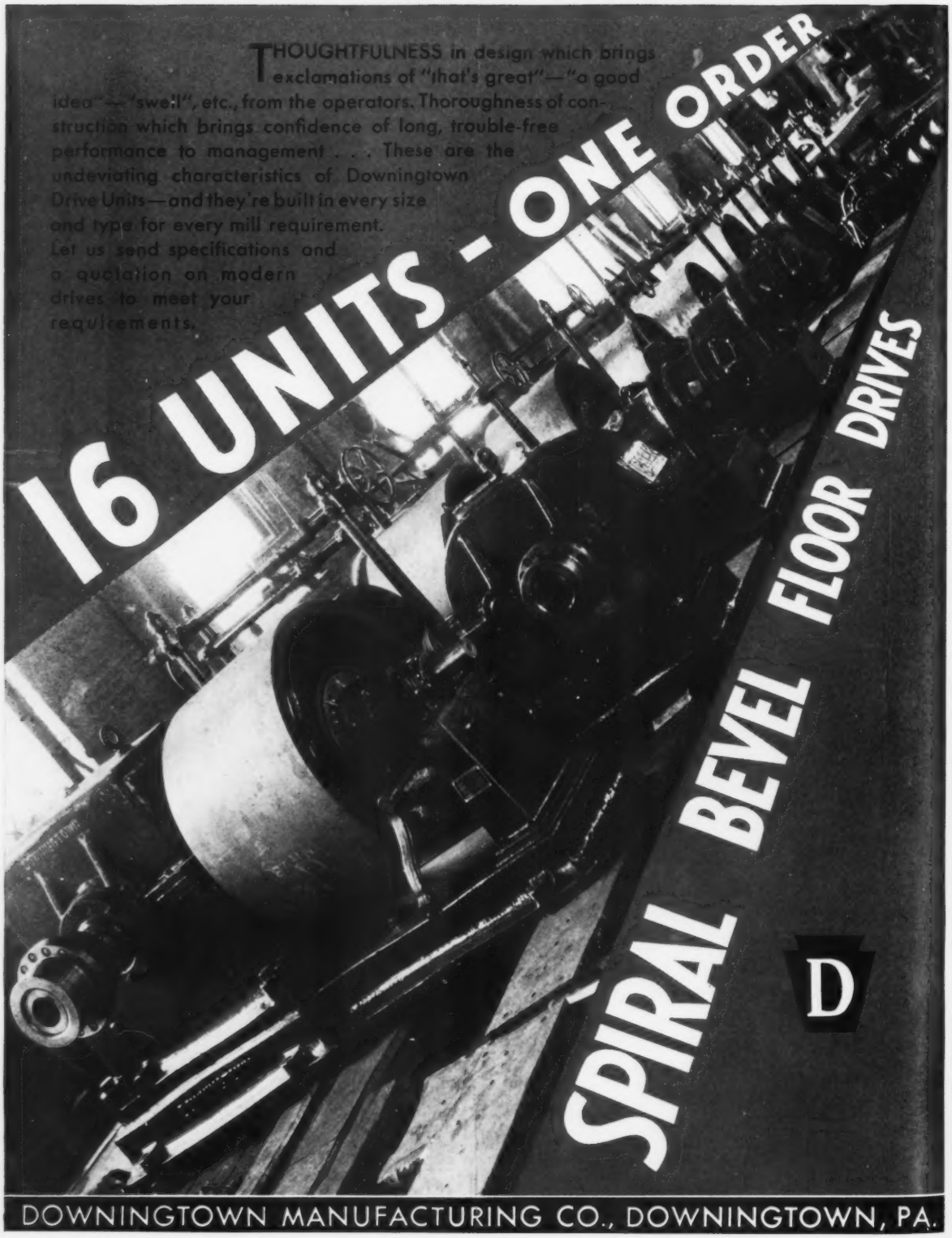
Vol. CV
No. 17

DOWNINGTOWN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PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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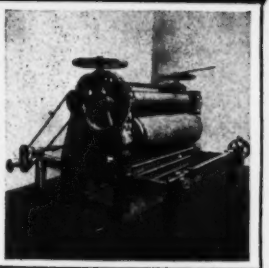
MODERN MACHINES *for* MODERN METHODS



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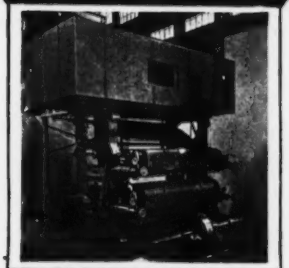

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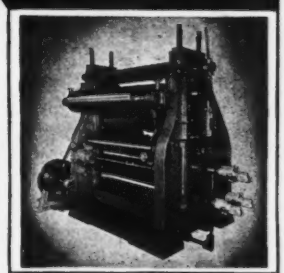

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Newest type machines that combine cloth, paper, regenerated cellulose and boards using paste, asphalt lacquer, latex and thermoplastics.

Apply adhesives to transparents smoothly.

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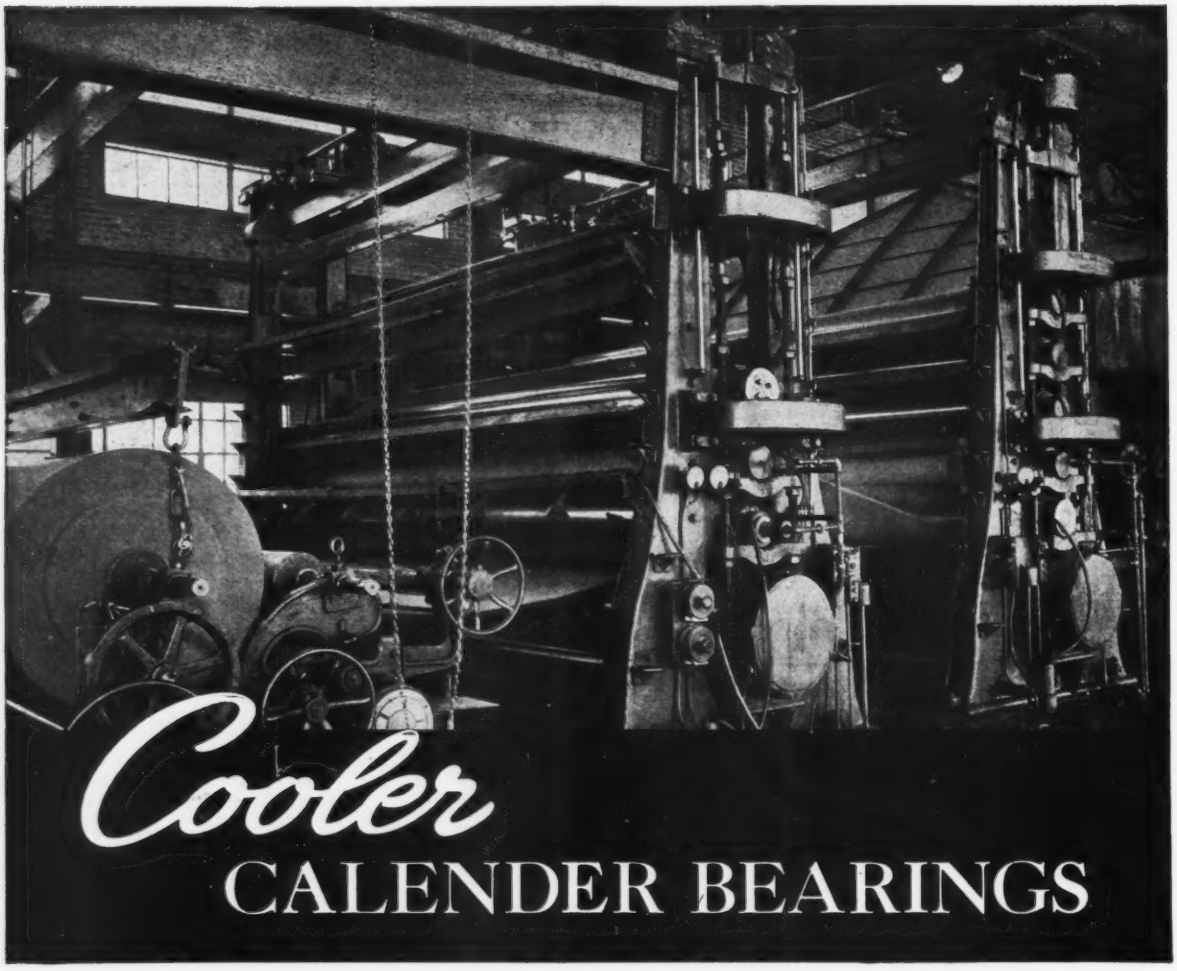

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PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

SIXTY-SIXTH YEAR

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with Paper Trade Journal.

Vol. CV, No. 17

Thursday, October 21, 1937

Established Sept. 21, 1910
Consolidated Feb. 19, 1925
with Paper Trade Journal.

Newsprint Industry Reverses Its Trend

Canada's Long Record of Rising Production and Expanding Consumption Has Set Back — Doubt Felt That Demand Can Keep Up With Present Output — Many Factors Complicate Current Situation — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 18, 1937.—The past week has witnessed a dramatic reversal of the buoyant trend in the newsprint industry which up to now had been unbroken for over a year. The long-continued story of new records in production and of expanding consumption, with prospects of a gradually mounting price structure, has received a rude shock. The events of the week, put in their chronological order, have been as follows:

1.—Publication of the news that the Canadian International Paper Company closed down its newsprint mills at Three Rivers, Gatineau, Dalhousie and Cornerbrook on October 11, which, being Thanksgiving Day in Canada, was a statutory holiday.

2.—The announcement that this was "understood" to be a prelude to the adoption of a five-day working week in this and other newsprint mills, instead of a six-day working week.

3.—The apparently sudden discovery, or fear, that the record production of this year had not represented a similar increase in consumption, but a record-breaking building up of warehouse stocks of newsprint.

4.—A recurrence of wide-spread apprehension over the price policy of the great Northern Paper Company, which in the past two years has upset plans by announcing a smaller increase than had been anticipated by the majority of Canadian and American manufacturers.

5.—A widespread break on the Montreal Stock Exchange in the price of newsprint securities.

Figures issued by the Newsprint Service Bureau, showed that in September there was a falling off in newsprint production of 6,362 tons as compared with the peak month of August, when 318,913 tons were produced. This was shown to be due entirely to fewer working days. The prospects now are, however, that there will be a continuance of lower production, and in some quarters it is predicted that for the balance of the year production is likely to be smaller than for the similar months of 1936.

There are two reasons for the steady increase in warehouse stocks—one that was foreseen, and one that was not. The first was the policy which early in the year was urged upon publishers, and followed by many of levelling out their orders in the lean months in order to build up stocks to prevent a shortage in the months of heavy consumption. The second, and unforeseen reason, was the collapse of the stock market in the face of booming business conditions. This latter has had a widespread effect on business enterprise and has resulted in market decrease in newsprint consumption as compared with what might normally be expected, and has aroused the fear of a further falling off in consumption.

At present the situation is far from clear. What appears to be obvious is that the marketing structure in the newsprint industry, and the price structure, at any rate as regards the second half of 1938, will depend upon the duration and strength of the business reaction and the success of the producers during the interim in tackling the problem of over-supply now faced by the industry.

In the latter connection it may be said that conditions are far different from what they were when over-supply was last such a destructive factor. Then the newsprint companies were all at loggerheads and engaged in a fierce cut throat policy of competition, on a devil-take-the-hindmost basis. Now there is a closer spirit of cooperation in the industry than at any time in the past ten years. Touching on this point the Montreal Gazette, in commenting on the restriction of production by the Canadian International Paper Company, says: "Of no little importance is the announcement that the International Paper Company is planning to adopt the five-day week, or rather to adjust its output to prospective consumption. While the only inference from this is that the outlook is for a shading in consumption, the real significance of the move lies in the fact that it denotes a marked change in the industry's tactics when a reduction in consumption appears to be in the offing. In other years, the strategy adopted in similar circumstances was to cut prices in an effort to secure tonnage, with what unfortunate results is all too well known."

The Financial Times, of Montreal, also stresses this point. It says: "With heavy stocks in publishers hands, built up during the Summer months, and a falling off in consumption now evident in some directions, certain of the newsprint companies currently find themselves with an inadequate volume of contract business to keep the mills at full capacity as they

(Continued on page 23)

News of the Wisconsin Paper Industry

Kimberly-Clark Operate 100 Consecutive Days Without An Accident—Appleton Signs With Independent Labor Organization — Reports Result On Drying Paper — Southern Kraft Speeds Up Machines—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 18, 1937—Plans for a celebration November 1 are being made by employees of the Kimberly-Clark Corporation's mill at Kimberly, Wis., providing the present objective of 100 consecutive days without a lost-time accident is achieved. The mill has more than 80 days to its credit now. If the goal is reached, there will be a community celebration, with a parade and band concert. On June 1, 1935, the workers had a similar event, when a record of 145 days was completed without an injury to a worker.

A contest from April 1 to October 1 during which employees were eligible for semi-monthly prizes if they did not find it necessary to report to a doctor for an on or off duty accident. The last fifteen days of September set a record, when every employee was eligible because of no injury of any kind. The groundwood department went through the entire period without a man reporting to a doctor, and won a grand prize of $50. This was the only one out of fourteen groups in the contest. The department employs 37 men, headed by Arthur W. Hoffman. So far in 1937, there have been only eight lost-time accidents as compared to 19 for the same period last year. A. J. Courchane is in charge of the safety work at the mill.

J. T. Doerfler, mill manager, spoke at a safety meeting last week, pointing out that while industries were successful in preventing accidents, the record on the outside is going backwards. Records show there is an accident every three seconds, and a death every five minutes. Twelve employees received prizes at the meeting.

With the exception of half a dozen workers, all of the 793 workers at the Kimberly mill have joined the Employes' Independent Union, recently organized to become the bargaining agent under new labor laws. The employees were given until October 20 to affiliate under the closed shop contract with the company. Meetings of the union are being held regularly, and members have been notified that their dues must be met promptly in order to retain affiliation. Harold G. Fird is president of the union.

Appleton Signs with Independent Union

Appleton Coated Paper Company, Appleton, Wis., has entered into a written contract with an independent labor organization of its employees, known as the Appleton Coated Paper Company Employees' Association. The company recognizes the union as the sole bargaining agency for its members. Terms regarding minimum wages, increases in wages, hours, overtime, holidays, vacations with pay, and seniority pay are contained in the agreement. Alvin B. Thies is president of the union.

Washington Hearings Concluded

Two days of hearings were concluded last week at Washington, D. C., on a declaration of intention of the Wisconsin Public Service Corporation to reconstruct an existing dam on the Wisconsin River at Tomahawk, Wis. The hearing was held before F. M. Durrance, examiner for the Federal Power Commission, asking to determine whether rebuilding of the dam, increasing the head of water and impounding water would affect interstate commerce by interfering with the river's flow in its navigable reaches. The Wisconsin Public Service Commission supported the corporation's argument that because the stream is not navigable at that point, the federal commission lacks jurisdiction over it. Briefs are to be filed by November 18, with an additional ten days to submit reply briefs. The dam formerly was owned by the Tomahawk Pulp and Paper Company.

Reports on Drying Paper

Results of fundamental research in the field of water vapor absorption and desorption which has an important bearing on factors affecting the drying and seasoning of paper was described by C. O. Seborg of the United States Forest Products Laboratory, Madison, Wis., at the Lake States section meeting of the Technical Association of the Pulp and Paper Industry at Conway Hotel, Appleton, Wis., last week. There is a tendency today, he said, towards demanding papers of certain specifications to meet requirements. Back in 1869 it was found that the strength of paper varied on damp and dry days. Small samples of paper are suspended in a compartment with controlled temperature and humidity on a quartz spring, used because it shows little fatigue and low absorption quality. Changes in the length of the spring are measured when the humidity is changed. He described other apparatus and experiments used.

Two other speakers from the laboratory also were present. C. E. Curran described the equipment and facilities used for pulp and paper research. L. V. Teasdale described the solution of the problem of insulating homes and buildings so the gathering of moisture and consequent leaking of walls and ceilings when there is no rain is eliminated.

Dr. Weidlein to Address Chemists

Dr. Edward R. Weidlein, president of the American Chemical Society, is to address the Northeast Wisconsin section of the society at a meeting October 19 at the Institute of Paper Chemistry, Appleton, Wis. He is director of the Mellon Institute in Pittsburgh. His subject is to be "Whither Industrial Research?" He will base his address on 25 years of experience in the field of research.

Southern Kraft Speeds Up Machines

Intentions of the Southern Kraft Corporation to increase the speed of its machines at its mills at Marinette, Wis., were revealed by Fred W. Motschman, local manager, in an address at a Rotary club meeting at Marinette during which he described in detail the processes of pulp and paper making, and the evolution of the industry to its present status of

efficiency. Machines are now turning out 800 feet of toilet tissue per minute, and the company intends to bring the production up to 1,000 feet, he said. Some tissue mills are contemplating a speeding up to 1,500 feet, he declared. Kraft mills of his company in the south turn out 700 tons of paper per day regularly on two machines, and a new mill at Georgetown, S. C., is expected to exceed this record with two machines. Newsprint mills at Gatineau, Cornerbrook and Dalhousie, Canada, are now running 1,150 feet per minute on regular production, Mr. Motschman said.

Power Failure Causes Suspension

The Minnesota Mining and Manufacturing Company, Wausau, Wis., manufacturers of abrasives, was forced to suspend operations for a time last week when a 2,800-volt power cable was cut. One of the pickets of a strikebound plant was alleged to have climbed a power pole and severed the cable. A John Doe warrant was issued for arrest of the man.

A. B. Hansen Describes European Mills

A. B. Hansen, general manager of the Northern Paper Mills, Green Bay, Wis., recently completed a trip to Denmark, Norway, Sweden and Finland, and described his experiences at a meeting of the Green Ray Rotary club. He was accompanied by Mrs. Hansen, and toured these countries in his own automobile. While in Finland, he visited a number of the paper mills there. Its new pulp mills are equal to those of the United States, he said. Paper manufacture there is far above that of other European countries. Labor unions are strong in that country, but as soon as any communistic influences from neighboring Russia are apparent, the government dissolves them, Mr. Hansen said, and they are reorganized. Common labor is paid the equivalent of eight cents an hour in American money. He greatly enjoyed the scenery and customs of the Scandinavian countries, but was not permitted to enter Russia with his automobile.

W. F. Buchanan Elected to Club

William E. Buchanan, vice-president and sales manager of the Appleton Wire Works, was elected vice-president of the Riverview Country Club, Appleton, Wis., at its annual meeting last week. T. E. Orbison, of the engineering firm of Orbison and Orbison, was re-elected secretary-treasurer. C. B. Clark, president of the Riverside Paper Corporation, and A. H. Thuerer, of Appleton Woolen Mills, were elected director for two years. Mr. Thuerer has just completed a term as president of the club, and is succeeded by E. L. Bolton.

Lacey Horton Honored

Lacey Horton, office manager of the Appleton Woolen Mills, Appleton, Wis., was elected grand standard bearer of the Grand Commandery, Knights Templar of Wisconsin, at its annual conclave last week at Madison, Wis.

Merkle-Duwel Nuptials

C. W. Merkle, assistant traffic manager of the Menasha Products division of the Marathon Paper Mills Company, Menasha, Wis., and Miss Lulu Duwel of Appleton, Wis., were married October 14 at the home of the bride. They are making a ten-day trip to the Carolinas, and will reside at 112 W. Spring St., Appleton.

Murphy Urges Brown Co. Accord

CONCORD, N. H., October 18, 1937.—Gov. Francis P. Murphy, in a statement issued here today, declared the state of New Hampshire had an active interest in the reorganization of Brown Company, one of the largest single remaining industries in the state, and urged financially interested parties to consummate a reorganization at the earliest possible date.

Declaring that it was essential to the state that Brown Company be placed in a vigorous position in the pulp and paper field, the Governor said that maintenance of the company's payroll of $120,000 per week was vital to the City of Berlin, Coos county and the state.

"The preservation of our industries in the condition of sound, going concerns is of utmost importance to us as a people," Gov. Murphy declared. "Accordingly the council and I have done and will continue to do all within our power to keep the people of New Hampshire employed at normal employment.

"I sincerely hope that the various groups financially interested in the reorganization of this great company will soon be able to reach an agreement on a plan under which it may be placed in a vigorous position in the pulp and paper field," he concluded.

The Governor's statement, coming as it does after announcement has been made that approximately 90 per cent of the creditors and a large percentage of preferred stockholders as well as bondholders have approved the plan is interpreted as a suggestion that various committees which have urged delay in acceptance of the plan "get together for the common interest of security holders and the welfare of the people."

In commenting on Gov. Murphy's statement, Stephen B. Story, fiscal agent of New Hampshire, who supervises the contract between Brown Company and the state whereby the company agrees to purchase wood from the state cut by men otherwise unemployed, said:

"Gov. Murphy's fine suggestion that interested parties should agree on a plan should speed the reorganization and eliminate any further delay."

Old Harmon Paper Mill Site Sold

[FROM OUR REGULAR CORRESPONDENT]

BROWNVILLE, N. Y., October 18, 1937—Announcement is made here of the purchase of the site of the old Harmon Paper Company by John Kilborn from Abe Cooper. The old mill and site were acquired by Mr. Cooper several months ago following the insolvency of the Philemon Creek Paper Company which leased the plant from representatives of the Harmon interests. After Mr. Cooper purchased the mill he dismantled it and salvaged all that was saleable.

Consolidated Granted Writ

[FROM OUR REGULAR CORRESPONDENT]

A writ of certiorari has been granted the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., by Circuit Judge Byron B. Park on its petition for a review of its 1937 tax assessment, claimed "unjustly high." The petition claimed that the 1937 valuation of $3,581,340 on real property (approved by the city board of review, is $170,540 in excess of the true assessable valuation as fixed by the state tax commission's assessors, who made the 1936 assessment on petition of the company.

Mills Cooperate With Chicago Distributors

Sulphite Bond Paper Market Now Firm, While Book Paper Prices Are Reduced — Increased Kraft Production Causes Anxiety — Special Meetings of Book and Writing Associations Well Attended — Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., October 18, 1937—Special meetings of the Book and Writing associations of the industry were held at the Blackstone Hotel, Chicago, during the latter part of last week. Well attended, they seemed to have a beneficial effect on the rather complicated local situation which has been a worrisome factor during the last few weeks. It is reported that some unsatisfactory spots in the sulphite bond field were ironed out and the sulphite bond market now remains firm with jobbers and manufacturers cooperating in an effective way. The book markets reported a reduction in all grades of books, statements coming to the effect that the reduction approximated five dollars a ton. In other lines news was less plentiful. Kraft market were reported less satisfactory with increased production causing some concern, although the feeling persists that these increases will be properly absorbed. Waste papers remained weak with little or no demand to sustain an excessive supply.

D. M. A. A. Meeting Planned

Advance reports indicate that the fifth annual Direct Mail Advertising Association exhibit to be held at the Hotel Sherman, November 9, 10, 11 and 12 promises to be the most unusual ever held. The "Showmanship of Direct Mail" is the theme of the 1937 exhibits, appropriately following such previous themes as "The 49 Ways to Use Direct Mail", "How 27 Industries Use Direct Mail", "Coordination of Direct Mail With All Mediums" and "The Nine Trails to Sales".

There are to be three main divisions of exhibits in the coming Chicago D.M.A.A. show. The Sideshow Midway will include the Little Show, the Thrills of Life and the Laboratory of Perpetual Motion. The latter "sideshow" promises to reveal the ramifications of direct mail concentrated into one complete chart, offering a laboratory of scientific facts about direct mail results.

The second division will feature the 50 direct mail leaders of the current year while the third division will display the Foreign Exhibit including a merry-go-round which takes the visitor around the world with direct mail. There are also to be many miscellaneous exhibits which will sparkle with the showmanship theme—barkers, circus wagons, girl guides in costume, a tent for the candid camera addicts and other appropriate features. The commercial exhibits will be offered on the same dignified, impressive and easily accessible basis as in past years and advance announcements indicate that the paper industry will be well represented in a four day event, running from noon until ten in the evening, that promises to be the biggest and most unusual of all the splendid Direct Mail Advertising Association programs.

To Install New Lime Kiln

Allis-Chalmers offices here state that the factory at Milwaukee, Wisconsin, is delivering a rotary lime kiln to the Southern Kraft Corporation mills at Spring Hill, Louisiana, which is the largest yet furnished to the paper industry. The kiln, costing approximately $62,500, is eleven feet in diameter and is two hundred and fifty feet in length.

Haering Co. Adds to Staff

Expanding of sales representation by the D. W. Haering Company, Chicago, has also included additions to the Chicago personnel with D. F. Mortara joining the staff as a chemical engineer and D. C. Suler, as a civil engineer. The Chicago concern manufactures scale and corrosion control chemical and proportioning materials and is well known as a supplier to the paper industry.

Strathmore Opens Sales Office

The Strathmore Paper Company is reported to have recently opened extensive sales headquarters in the Lytton Building, 14 East Jackson, Chicago.

Describes Line of Imported Papers

The Swigart Paper Company utilizes the back cover of "Paper Progress" which goes to customers of local jobbing concerns, to describe its line of 107 imported papers, a complete review of paper making conceptions in the world. Japanese colors, French Marble Papers, Chinese Nanking Papers, Lombardi Cover from Italy, Japanese Shadow papers and others are offered to the paper buyer with the invitation that they may best be seen by visiting the Swigart sample exhibit room at 717 S. Wells Street.

The October "Informant" published through the Midland Paper Division of the Zellerbach Paper Company, is seasonally appropriate and contains a number of most interesting articles on early morning calling on the part of salesmen, suggestions as to increased sales and an informative discussion on the making of newsprint paper. The paper used is Warren's Cumberland Gloss, 25 x 38, Substance 100, White.

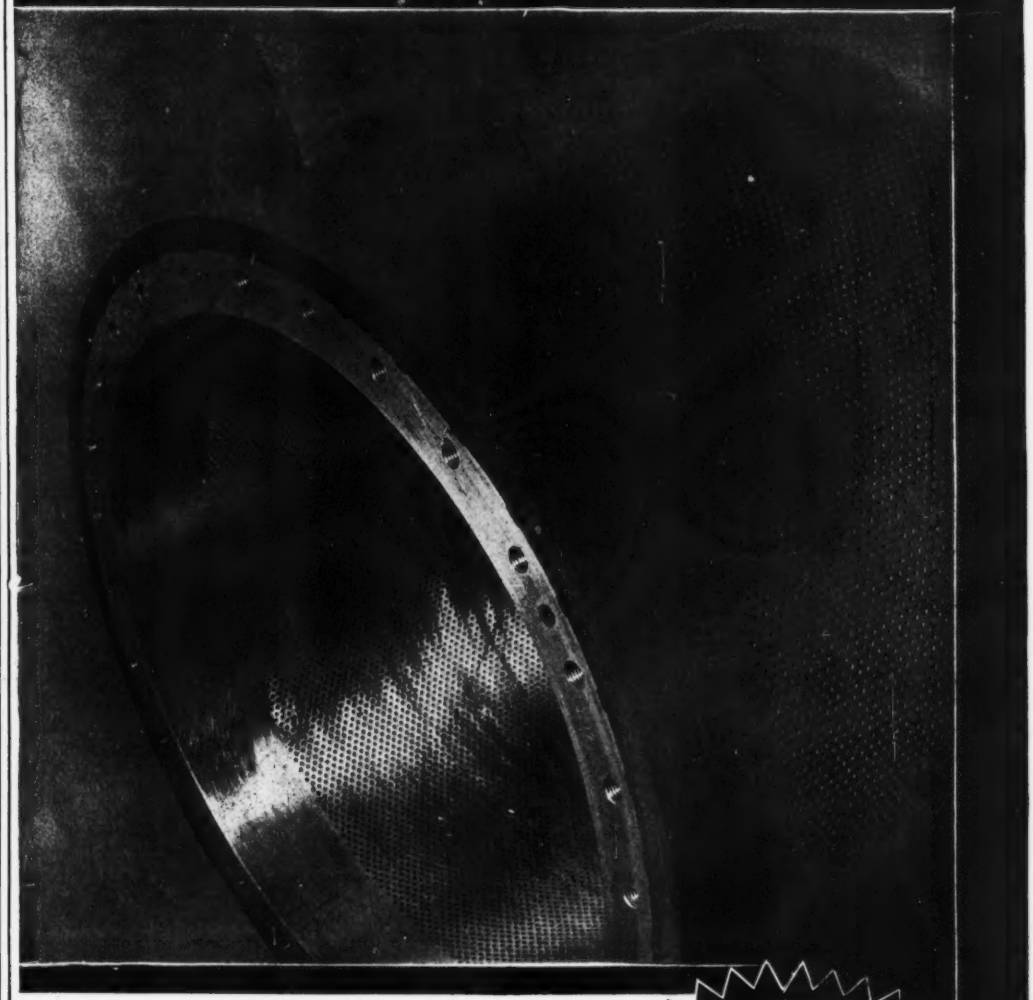
Government Paper Bids

WASHINGTON, D. C., October 20, 1937. — The Government Printing Office has received the following bids for 10,000 sheets of 22 x 28 gray photo mount board; Reese & Reese, Inc., $39.60 per M sheets; M. S. Ginn & Co., $38.20 less 2 per cent; Mathers-Lamm Paper Company, $36.77; Whitaker Paper Company, $36.59; R. P. Andrews Paper Company, $38.60; Charles W. Speidel & Co., $42.28; Charles G. Stott & Co., $40.40; George W. Millar & Co., $39.00; Burlock Brothers, Inc., $38.61 less 2 per cent; Old Dominion Paper Company, $38.49; Dobler & Mudge, $45.30; Barton, Duer & Koch Paper Company, $47.50.

For 500 pounds of facing stero tissue paper: Russell Products Company 83 cents per pound.

BELOIT

RUBBER-COVERED SUCTION ROLLS



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2. Crushing
3. Shut-Downs
4. Felt Troubles
5. Pick Ups
6. Finish
7. Quality
8. Felt Life
9. Production

BELOIT IRON WORKS PAPER MACH'Y BELOIT, WIS., U.S.A.

The *Beloit* Way is the *Modern* Way

BELOIT IRON WORKS
Beloit, Wis., U. S. A.

Box Manufacturers Discuss Minimum Wages

Meet At Boston and Appoint Committees From Employers and Employees — Storehouse of Hinde & Dauch Burned — Salesmen's Compensation Is Discussed At Meeting of Paper Distributors Cost Finding Committee.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., October 18, 1937—A meeting of set-up box manufacturers and corrugated box manufacturers was held at the Hotel Manger here Thursday evening for discussion of the fact that none from their sections of the paper box industry had been appointed by the Massachusetts Minimum Wage Commission as members of the wage board. The matter was discussed at length.

The Minimum Wage Commission had previously asked members of the paper box industry, manufacturers, to submit nominations and send them to the Commission. The appointees were from consuming companies and two folding box manufacturers.

In the Act relative to the wages of women and minors is the following: "The commission shall appoint the members of such wage board, the representatives of the employers and employees to be selected as far as practicable from nominations submitted by employers and employees in such occupation or occupations."

The appointees are as follows:

EMPLOYERS—Harry Posner, Worcester Paper Box Company; James F. Reynolds, Stone & Forsyth Company, Boston, and Edward Churchill, W. L. Douglas Shoe Company, Brockton.

EMPLOYEES—Edward Mangum, Eaton Paper Box Company, Pittsfield, Mass.; Mary Burt, Dickerman Box Company, Cambridge, Mass., and Joseph Dart, representative of the Boston office of the Printers' Union. The State is to appoint at least one other member of the board.

Thompson & Norris Div. Burned

A fibre and cardboard storehouse of the Thompson & Norris Division of the Hinde & Dauche Paper Company, manufacturers of corrugated paper boxes near Braintree street, Brighton, was levelled by fire Wednesday evening. The loss, estimated at $100,000, is covered by insurance.

The storehouse, a two and a half story building, 160 feet long by 70 wide, was filled with products, including shipping boxes, cartons, packing cases and rolls of fibre, which burned so fiercely that the fire was over in a few minutes. The main plant, 35 feet away, at 119 Braintree street, was not endangered.

The fire was discovered by Patrolmen Daniel Fitzgerald and Henry Brogan of the Brighton station as they were passing in a cruising car at 11 o'clock. At that time, the upper part of the storehouse was ablaze, with flames bursting through the roof. Three alarms were turned in in quick succession.

The cause is unknown, but was possibly from defective wiring. A new storehouse will probably be built.

Salesmen's Compensation Discussed

At a meeting of the Paper Distributors Cost Finding Committee, held at the Boston Chamber of Commerce, Friday, an exceedingly interesting discussion took place in regard to salesmen's compensation. Replies of various kinds on a questionnaire concerning this subject were considered. Harry J. Dowd, chairman, presided at the meeting, which was attended by about fifteen.

Cromwell Jones Speaks

Cromwell Jones, representative of the Seaman Paper Company, Chicago, Ill., gave a very interesting talk on the possibility of greater sales development of top sheet tympan to the sales force of Carter, Rice & Co., Corporation, on Saturday. Frank H. Winter, sales manager, presided. Carter, Rice & Co., Corp., have begun their removal to 273 Summer street.

John C. Hurd Calls on Paper Merchant

John C. Hurd, executive secretary of the New England Paper Merchants Association, went to Springfield, Mass., Friday afternoon, calling on the Trade, both members and non-members, the following day.

Knight, Allen & Clark Change Officers

Knight, Allen & Clark, Inc., have made one large room of their front office at 295 Congress street, giving added facilities.

Rushmore Mill To Start Soon

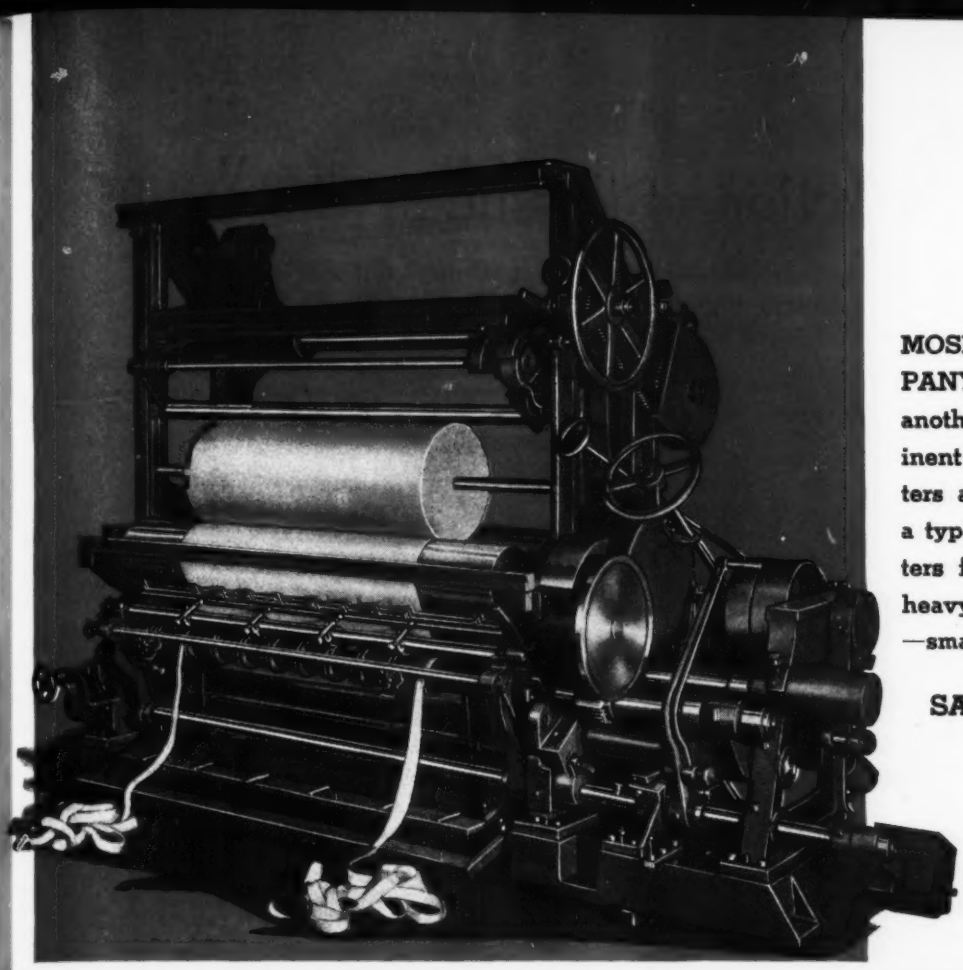
[FROM OUR REGULAR CORRESPONDENT]

GOUVERNEUR, N. Y., October 16, 1937.—Construction work on the rebuilding of the Rushmore paper mill at Natural Dam is progressing rapidly and indications are that everything will be ready for a resumption of activities soon. The plant was almost completely destroyed by fire last spring and the rebuilding program was launched during the summer. Most of the steel girder framework has been placed in position on the new finishing plant, a two-story structure, which has double the capacity of the building which was burned to the ground recently. The walls on three sides of the finishing plant have been rebuilt as far as the first story and a section of the roof over the building has been installed. The large paper machine in the mill is also being reconditioned. The walls of the mill itself have been rebuilt and work on the construction of a new flume is nearly completed.

Ivanhoe Corp. To Make Display Paper

[FROM OUR REGULAR CORRESPONDENT]

CAMBRIDGE, Mass., October 18, 1937.—The Ivanhoe Corporation, a new company, designers and manufacturers of display paper products for windows, is located at the plant of the Cambridge Paper Box Company. William H. Perry, head of the Cambridge Paper Box Company, is sales manager of the new concern, which has national distribution. Mr. Perry attended the convention of the International Display Men's Assocation in Chicago.



MOSINEE PAPER MILLS COMPANY of Mosinee, Wisconsin is another of the long list of prominent firms using Langston Slitters and Roll Winders. There is a type and size of Langston Slitters for every job; from tissue to heavy board;—narrow to wide cuts; —small to large diameters.

SAMUEL M. LANGSTON COMPANY
Camden, New Jersey

Langston Slitters and Roll Winders

CLEAN
SHEAR CUT
CUT

Scott Production of Tissue at Capacity

Mill Output Will Be Increased By 16 Per Cent With New Machine Now Being Installed — Modern Paper Co. Changing Production From Kraft and Parchment to Tissue — Philadelphia Ass'n Meets — Other News.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 18, 1937 — Reports indicate that demand for the Scott Paper Company's products is running somewhat ahead of production, although the plant is being operated at capacity. Paper mill facilities are being increased by the addition of a new machine, which is now being assembled and will be in production by the end of the year. The machine, building and accessory equipment of this expansion will cost approximately $1,250,000.

The machine is being made by the Beloit Iron Works and has been especially designed for the production of tissues and tissue towels. It will increase the manufacturing capacity of Scott's mill at Chester, Pa., by approximately 16 per cent.

Sales of this company's product last year totaled $11,600,000 and are currently running at the rate of $14,000,000 for 1937.

Modena Improving Mill

Among other improvements being made for The Modena Paper Company, Modena, Pa., is the overhauling and remodeling by Moore & White Company, Philadelphia, of a machine that was formerly used for making kraft paper and parchment into a machine for making light-weight tissues. The expansion program at Modena is under the direction of Fred L. Smith, Paper Mill Engineer, 21 E. 40th street, New York, and it is expected that the mill will be in full scheduled operation about December 15th.

Paper and Cordage Association Meeting

At the regular monthly luncheon meeting of The Philadelphia Paper and Cordage Association, held in the Rose Room of Adelphia Hotel, on Friday last, the nominating committee consisting of George K. Hooper, chairman, James Andrew, Schuylkill Paper Company, Sam Shyrock, Shyrock Brothers, Harry S. Platt, Denney Tag Company and John Hererly, Garrett-Buchanan Company, was appointed. The result of their selection will be made known at the next meeting, November 19th.

President E. K. Lay, who was welcomed back after a few weeks' illness, stated that the membership goal of one hundred has been exceeded, and he was very grateful for the unstinted cooperation among the members and their strict adherence to the code of ethics of the Association.

The guest speaker at the luncheon was Joseph H. Hagedorn, formerly Director of Purchases under Mayor Moore, who presented a word picture of his four years' experience under the Moore administration.

Speaks on Association Work

George K. Hooper, president of Hooper Paper and Twine Company, and a former president of the Philadelphia Paper and Cordage Association, was guest-speaker at a dinner meeting on Monday evening of The Engravers Club of Philadelphia, held at Hotel Vendig. Mr. Hooper Spoke on the value of association work, and the interrelation of the paper merchant to the engraver.

To Buy Pulpwood from Farmers

CHARLOTTE, N. C., October 18, 1937. — Most of the pulp and paper companies having mills in North Carolina or which are buying pulp wood here for use in other states, even though they already have large acreage holdings in the state, are planning to buy the pulp wood they need from the landowners and farmers just as long as they can get the necessary supply from them, according to F. H. Claridge, assistant state forester in charge of forest management for the forestry division of the Department of Conservation and Development.

The pulp wood companies are buying up large areas of timber land to hold in reserve for future use if at any time the general supply of pulpwood becomes exhausted or so limited that it can no longer be depended upon, Claridge said. They also know that the amount of available timber on these areas will materially increase if no cutting is done for ten or twenty years.

Chicoutimi Pulp Mill to Re-open

According to a statement made here by Premier Duplessis, the pulp mill at Chicoutimi is likely to be re-opened in the near future. He said that the Government had just received two additional offers from business men, and the propositions were of a serious nature. He was led to believe, consequently, that it would not be long before there was established a durable industry at Chicoutimi which would bring about a return of prosperity.

Vote for C. I. O. Union

FRANKLIN, Ohio, October 18, 1937.—H. L. Cheney, owner of the Cheney Pulp and Paper Company of this place states that production employees voted 33 to 21 last week in favor of a Committee for Industrial Organization Union as bargaining agent. The election was conducted with the consent of the management, Mr. Cheney said.

General Paper Co. Incorporates

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., October 18, 1937.—With authorized capitalization of $50,000 the General Paper Company, Ltd. has been incorporated at Victoria, B. C. Registered offices are at 510 West Hastings street, Vancouver, B. C., and the firm intends to carry on business as dealers in all kinds of paper products and paper.

Reports 1937 Production of Abitibi Mills

Receiver and Manager of Abitibi Power & Paper Co. Places Capacity At About 558,000 Tons of Newsprint — Shipments for 1937 Nearly 490,000 Tons — New Paper Container Co. Formed — Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., October 18, 1937—A report of receiver and manager of Abitibi Power and Paper Company, as at October 7, just issued, shows that the capacity of the mills, exclusive of Espanola and Sturgeon Falls, is 558,000 tons of newsprint. This is based on continuous operation for 309 days, whereas at 92 per cent of capacity, allowing for emergencies, etc., output would be 535,000 tons.

According to the engineers' report, estimated cost of improvements and repairs to Abitibi property, together with replacements and repairs, exclusive of Espanola and Sturgeon Falls is $8,314,271, such improvements to increase capacity by 93,310 tons and result in an annual saving of $1,057,623 in costs of operations. Engineers report that Espanola and Sturgeon Falls are not economic units and rehabilitation would not pay.

Estimated shipments of newsprint for 1937 are given as between 480,000 and 490,000 tons and the receiver says: "With new contracts already obtained, or in course of closing, and renewals of present contracts expected to be received, it is estimated that 1938 shipments will exceed 500,000 tons." The price expected to be received in the first six months of 1938 is $50 per ton, up $7.50 from 1937.

The receiver goes into the matter of revenues and costs in detail, and basing figures on recent records estimates $3,130,719 net before interest, depreciation, income taxes, costs of reopening mills, and for the last six months $3,305,719.

The engineering report placed the replacement value of properties, exclusive of the two non-commercial units and Provincial Paper, Ltd., at $78,000,000, on a full and modern basis, the company's interest in Provincial Paper being $1,500,000 or more. Having regard to probable needs, Abitibi officials and the receiver are of the opinion that if the company be given working capital of $9,000,000 and borrows from its bankers on peaks it can operate satisfactorily.

New Paper Container Co. Formed

A new company known as Perga Containers Ltd., is about to go into production at 1581 Main street, W. Hamilton, Ont. They have recently built a new plant of steel and tile construction with concrete floor and tile and gravel roof. It is planned to manufacture a paper container which can be used for marketing milk, honey, syrup, cheese, ice cream, biscuits, candy, etc. It will be a light weight container made from sulphite paper stock, waxed both inside and outside and can be in any design of one or two colors. The machines which have been installed have a production capacity of approximately 30 million containers annually. The officers of the new company are: Hon. George Beresford, president; R. H. Innes, vice-president; D. H. Webster, secretary-treasurer, and B. T. Gilly, director.

An Echo of the Abitibi Case

Motion for an order to commit to jail Roy Sharvell McPherson, liquidator for the Abitibi Power and Paper Company, Ltd., for alleged contempt, refusing to be sworn or be examined for discovery in the action against Abitibi of the Montreal Trust Company, to enforce a bond mortgage, was made by Strachan Johnson, counsel for the trust company, before Mr. Justice Kingston at Osgoode Hall, Toronto, this week. Mr. Johnston further moved, in the alternative, that the statement of defense filed by Mr. McPherson in the action be struck out and for an order that McPherson attend at his own expense to be examined in regard to matters relating to the action. Decision was postponed.

Box Makers Hold Tournament

Nearly seventy-five members of the Canadian Paper Box Manufacturers' Association enjoyed a well-contested series of golf games in their annual tournament at the Galt Country Club a few days ago. The event was sponsored by the Toronto Carton Council. At the dinner following the games F. W. Fisher, chairman of the council, acted as toastmaster, and replies to toasts were made by Luke Morrison, a past president of the Association, George Hancock of the Galt Paper Box Co., and others. Following are the prize winners: low net, N. Bennett; low gross, Jack Hewitt; second low net, H. Small; second low gross, George Hancock; high gross, S. Hart; high net, C. C. Jones; low sealed holes, F. A. Fielder; high sealed holes, R. S. Donlop. The horseshoe winners were Bart Sproule and W. T. Filey, with runners-up J. Henderson and W. J. McIntyre.

Sherman Reorganization Plans

[FROM OUR REGULAR CORRESPONDENT]

GREAT BEND, N. Y., October 18, 1937—A hearing relative to the reorganized Sherman Paper Company is scheduled before Federal Judge Bryant on November 4 which will determine whether the concern is to continue the operation and possession of its mills or whether a trustee shall be appointed. Under its reorganization plan the company has selected John R. Wilmot, a new director, as president and J. Victor Baron as vice president and general manager. O. Palmer Barnes will continue as secretary and treasurer. Mr. Wilmot is connected with the Agricultural Insurance Company and his mother was a sister of the late George C. Sherman, former president and controlling factor of the concern, which was named for him after his death. Since the death of the latter, Mr. Baron has been vice president and general manager and Mr. Barnes the secretary and treasurer. Under the reorganization proceedings the company hopes to reduce operating costs where, with a moderate increase in orders, the company can score a margin of profit. Petition for reorganization is signed by Mr. Wilmot and under the order by Judge Bryant the salary of Mr. Baron is reduced to $500 a month and that of Mr. Barnes to $250 a month pursuant to action of the new board of directors taken at a recent meeting.

Financial News of Pulp and Paper Industry

Federal Commission Denies International Paper and Power Co's. Application for Rehearing — Abitibi Bondholders Approve Plan — Puget Sound Reports Earnings — Dixie-Vertex Earnings Up — Other News.

New York Stock Exchange

High, Low and Last for the Week Ending October 20, 1937

	High	Low	Last
A. P. W.	4½	2⅝	3⅝
Armstrong Cork Co.	38	30	37
Celotex Corp.	26	21	23
Celotex Corp., pf.	62	53	53
Certain-Teed Products Corp.	7	3⅛	6¼
Certain-Teed Products Corp., pf.	29½	18½	....
Champion Paper & Fibre Co.	40	29½	35
Champion Paper & Fibre Co., pf.	108	107	107
Congoleum-Nairn Co.	26½	21	25½
Container Corp. of Amer.	17¼	10¾	16¼
Continental-Diamond Fibre Co.	11⅛	5½	10
Crown-Zellerbach Co.	13½	8½	12⅞
Flintkote Co.	15½	11½	15
Robert Gair	6½	3⅜	6½
Robert Gair, pf.	25½	20	22½
International Paper & Power	13	7½	11¾
International Paper & Power, pf.	54½	36¼	47¾
Johns-Manville Corp.	90	74	85
Johns-Manville Corp., pf.	124	122	122
Kimberly-Clark Corp.	29	24	24
MacAndrews & Forbes	28½	26¾	27
Masonite Corp.	32	20	30¾
Mead Corp.	17⅝	11½	15¼
Mead Corp., pf.	83	70	80
Paraffine Companies, Inc.	47	38	44
Ruberoid Co.	20¾	17¼	19
Scott Paper Co.	39	36½	36½
Sutherland Paper Co.	21	18	19
Union Bag & Paper Corp.	14¼	9	10¾
United Paperboard Co.	5½	3½	5½
U. S. Gypsum Co.	72½	66	71
U. S. Gypsum Co., pf.	158¾	154¾	154¾

New York Curb Exchange

High, Low and Last for the Week Ending October 20, 1937

	High	Low	Last
American Box Board Co.	11¼	5	11
Brown Co., pf.	51	30	40
Great Northern Paper Co.	29½	27	28½
St. Regis Paper Co.	4⅛	2¾	3⅝
St. Regis Paper Co., pf.	75	75	75
Taggart Corp.	5¾	4⅛	5⅜

Deny Rehearing of I. P. Application

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 20, 1937. — The Federal Securities and Exchange Commission has handed down a decision in which it has denied a rehearing to John Lawless, Jr., a stockholder of the International Paper and Power Company with respect to the application of that company on which the Commission entered an order on July 31.

In connection with the Lawless application for rehearing the Commission has the following to say:

John Lawless, Jr., a stockholder of International Paper and Power Company, applied to us September 9, 1937, for a re-hearing of the application which that company filed with us on March 12, 1937.

The first ground relied upon by Lawless as a reason for a re-hearing is that "The findings and opinion of the commission and its order of July 31, 1937, exempting issue and sale of certain securities of International Paper and Power Company were not acted upon, considered or issued by a majority in number of the members of the commission, or even a majority of those commissioners who heard or took part in these proceedings."

The hearing held July 15, 1937, was attended by Commissioners Landis, Mathews, Douglas and Healy. The findings and order of July 31, 1937, were adopted at a meeting of the commission attended by Commissioner Landis, then chairman, and Commissioners Mathews and Douglas. Commissioners Ross and Healy were necessarily absent. Commissioners Landis and Mathews voted for the findings and order. Commissioner Douglas voted against them. Thus they were adopted by a majority of a quorum and not by a majority of the commissioners. This circumstance does not make the vote invalid.

There are good grounds for believing that the commission has the legal right to grant the rehearing. Whether the commission ought to do so is the important question. Lawless on the 25th day of August, 1937, notified us by letter that it was his intention to appeal from the order of July 31st to the Circuit Court of Appeals, and on the 11th day of September, 1937, filed his petition for review with the United States Circuit Court of Appeals for the First Circuit, serving a copy of such petition on the Commission on September 16, 1937. On or about the 17th day of September, 1937, the new securities which were scheduled for immediate issuance under the plan of reorganization became available to security holders.

The new securities were registered under the Securities Exchange Act of 1934, the preferred stock and common stock being listed on the New York Stock Exchange and first dealt in on September 20, and the warrants being listed on the New York Curb Exchange and first dealt in on September 17.

Since the listing of these new securities, they have been actively traded on the above-mentioned exchanges. Prior to that time they were the subject of considerable "when-issued" trading in the over-the-counter markets.

Mr. Landis is no longer a member of the Commission. Mr. Ross did not hear the arguments. Although Commissioners Douglas and Healy still hold to the views stated in their dissents as to certain aspects of this matter, and if the order of July 31, 1937, were now up for decision by the three commissioners participating in the disposition of this application for rehearing, it would fail of passage by two votes to one, nevertheless, in the circumstances already detailed, it is our unanimous conclusion that the petition for re-hearing ought to be denied.

In reaching this conclusion we have not failed to consider the second and third grounds of the Lawless application. The second is little more than a formal reiteration of the view already rejected by a majority of the commission after full hearing, i.e., that the commission was without jurisdiction to issue its report on the International Paper and Power Company's Plan of Reorganization and to enter its order of July 31, 1937. The third ground includes application for leave to adduce "additional evidence with reference to the earnings of the company to establish the unfairness of the plan of reorganization of the Company," the charge of unfairness resting on the claim that the earnings of the company during "the past months of 1937" indicate earnings for 1937 in

excess of $14,000,000. The Commission's majority and minority reports on the Plan were made May 5, 1937. We see no good reason for now attempting a further review of any of the problems and questions engendered by the plan.

Abitibi Bondholders Accept Plan

The Ripley plan for reorganization of the Abitibi Power and Paper Company, Ltd., was approved at a meeting of bondholders held at Toronto, Canada, on October 15. The vote was: For the plan, 238,695 votes, representing $23,869,500 par value of bonds; against, 76,845, representing $7,684,500 par value of bonds.

The meeting was called under a court order to vote on the plan of sale of assets and reorganization presented by a committee headed by Joseph P. Ripley of New York.

The committee proposed that $14,000,000 of prior lien bonds be issued for working capital purposes. In addition, the plan provides for issuance of $24,133,500 of general mortgage convertible 5 per cent bonds and convertible income debentures to the amount of $33,786,900.

The meeting nominated eight persons to be Class A directors of the new company on motion of Mr. Ripley. Those nominated are T. T. Clarkson, G. R. Cottrelle, Andrew Fleming, Glyn Osler, Edward E. Reid, W. H. Smith, W. A. Somerville and Mr. Ripley.

Colonel J. L. Ralston, counsel for another group of bondholders, objected to the nominations on the ground that there were "grave doubts" of the meeting's authority to make such nominations.

Puget Sound Earns $1.44 Per Share

Earnings for the eight months ending August 31, 1937 of Puget Sound Pulp and Timber Company amounted to $359,018.89 after depreciation and all other charges, but before income, excess profits and undistributed profits taxes. Such earnings for the first eight months were equal to $1.44 a share on the new common stock.

The financial condition of the company, according to Ossian Anderson, president, is quite satisfactory, its current position being approximately three to one. Mr. Anderson stated that manufacturing costs for August were $1.65 a ton lower than for the month of July. The cost of conversion of logs to pulp wood was the lowest since taking over the cut-up plant. The Bellingham mill operated to capacity, producing an average of 114 tons a day, the highest production ever recorded at this plant.

The company is having no difficulty in securing plenty of space for the shipment of its pulp to Japan.

Marathon to Increase Preferred Stock

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 18, 1937.—A special meeting of stockholders of the Marathon Paper Mills Company, Rothschild, Wis., was called last week by the board of directors to increasing the number of shares of its $100 preferred stock, the first step in a major capital structure change. It was proposed to increase the stock from $600,000 to $1,200,000, or from 6,000 shares to 12,000 shares.

Finances for a giant new pulp mill to be constructed by the company in Canada and for other corporate purposes are reported to be sought. The program eventually is extended to the bonded debt.

Action also was expected on the payment of dividends on preferred stock. No dividends have been paid on this stock for several years. The shares are 6 per cent cumulative, with no preference as to assets or dividends. The stock is callable on any dividend date on thirty days' notice at $100 and dividends.

Great Northern Announces Increase

The Newsprint Committee of the American Newspaper Publishers Association, in a bulletin sent out Tuesday, notified the association's members that the Great Northern Paper Company, one of the leading manufacturers in the United States, had announced an increase of $5.50 a ton for the first six months and of $7.50 a ton for the last six months of 1938 over 1937 prices.

"The New York and Chicago delivered prices a ton for 1938, as announced, will be—first six months $48, second six months, $50," said the bulletin of the Newsprint Committee of which William G. Chandler, of the Scripps-Howard Newspapers, is chairman.

"Many newspapers hold contracts with Canadian manufacturers carrying through 1938 guaranteeing a price no higher than Great Northern; it, therefore, would seem that Great Northern has set the maximum price for the entire country.

"While the Great Northern's announced price, for the first six months of next year, is $2 a ton less than the price previously announced by leading Canadian manufacturers, nevertheless, the proposed increase to newspapers in the United States will approximate $25,000,000.

"Such a tremendous additional financial burden on newspapers in the United States, following as it does, increases in newsprint prices in 1936 and 1937, will force drastic reductions in consumption by newspapers."

Some members of the committee suggest that it will undoubtedly require an increase in circulation and advertising rates.

$50 Price Holds in Canada

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 19, 1937—Announcement of the Great Northern Paper Company of its newsprint price policy for 1938—$48 per ton for the first half, and $50 for the second—brought from three of Canada's leading producers quick reaffirmation of the $50 rate for the first half of 1938 announced by them early this year. These producers are the Canadian International Paper Company, for whom J. R. Cullen spoke; Price Brothers & Co., for whom President C. H. L. Jones spoke; and the Abitibi Company, for whom G. T. Clarkson, receiver and manager spoke. All three stated that they had not determined their price for the second half of 1938. Mr. Jones, of Price Brothers voiced what appeared to be the general view of Canadian newsprint operators when he said: "We do not look upon Great Northern's policy as a price criterion, because its entrenched financial position apparently affords it sources of income not available to the normal newsprint producer to whom a price of $50 a ton is now a barely liveable level."

Paperboard Industry Runs at 79 Per Cent

Monthly statistics in paperboard .012 of an inch in thickness for August compared with the preceding month have just been released by Director William L. Austin, Bureau of the Census, Department of Commerce. The statistics were compiled from data furnished by the National Paperboard Association from reports of members and by manufacturers reporting direct to this Bureau.

The production of paperboard for August, 1937, amounted to 365,521 short tons, or 79.3 per cent of the rated capacity of the mills reporting. The ratio of inch hours of operation to rated capacity for August, 1937, was 75.2 percent, as compared with 69.8 per cent for July, 1937, 76.5 per cent for August, 1936, and 67 per cent for August, 1935.

TABLE I.—INCH HOURS OPERATED, PRODUCTION, AND ORDERS (99 MANUFACTURERS FOR MONTHS OF 1937, AND 95 FOR MONTHS OF 1936 AND 1935)

Year and Month	Operated (Inch hours) (Based on last dryer width) Rated capacity	Operation for month	Per cent of rated capacity	Production (Short tons) Rated capacity	Production during month	New orders received during month (short tons)	Unfilled orders, end of month (short tons)
1937							
Jan.	15,359,197	12,245,898	79.7	445,686	365,665	407,716	221,409
Feb.	14,277,332	12,327,520	86.3	414,796	373,431	386,781	236,011
Mar.	16,366,534	14,171,655	86.6	467,701	428,506	453,621	265,575
Apr.	15,525,766	13,892,463	89.5	451,340	418,665	404,108	200,833
May	15,468,886	13,379,968	86.5	450,211	408,497	356,687	154,379
June	15,594,669	11,774,735	75.5	453,156	363,390	315,787	100,785
July	16,246,317	11,346,605	69.8	472,031	344,080	326,334	90,391
Aug.	15,860,998	11,934,315	75.2	461,011	365,621	346,009	72,944
Total (8 mos.)	124,699,699	101,073,159	81.1	3,615,932	3,067,755	2,997,043	.....
1936							
Jan.	15,251,225	9,970,298	65.4	427,564	271,210	284,854	95,358
Feb.	14,173,988	9,682,428	68.3	396,354	271,107	268,843	91,917
Mar.	14,583,725	10,128,474	69.5	411,199	285,257	290,854	96,202
Apr.	14,630,429	10,495,934	71.7	412,267	295,899	297,984	99,796
May	14,497,925	10,140,595	69.9	407,729	289,527	280,899	92,784
June	14,545,973	10,186,905	70.0	409,510	288,682	290,098	96,402
July	15,057,386	10,699,561	71.1	431,139	299,033	304,747	101,557
Aug.	14,545,972	11,122,150	76.5	416,338	319,391	332,553	117,443
Total (8 mos.)	117,286,623	82,426,345	70.3	3,312,100	2,320,106	2,350,832	.....
Sept.	14,466,821	11,359,779	78.5	415,126	328,519	353,197	135,732
Oct.	15,189,530	12,669,229	83.4	435,081	359,849	357,783	138,830
Nov.	14,097,513	11,350,376	80.5	403,871	321,624	308,732	127,193
Dec.	15,177,270	11,537,682	76.0	434,969	328,773	350,452	130,472
Total (Year)	176,217,757	129,343,411	73.4	5,001,147	3,658,871	3,720,996	.....
1935							
Jan.	15,455,578	9,793,592	63.4	416,501	262,026	273,151	80,987
Feb.	13,636,918	9,308,323	68.3	366,598	251,870	252,578	84,341
Mar.	14,709,922	10,029,490	68.2	398,949	275,770	268,360	79,049
Apr.	14,901,848	9,543,895	64.0	402,831	260,851	255,730	79,296
May	15,498,589	9,615,348	62.0	418,324	262,463	259,995	80,367
June	14,284,978	9,418,123	65.9	385,742	256,665	248,656	78,020
July	15,592,118	9,397,786	60.3	423,545	260,207	259,486	78,241
Aug.	15,592,118	10,450,399	67.0	423,545	291,127	297,349	86,767
Total (8 mos.)	119,672,069	77,556,956	64.8	3,236,035	2,120,979	2,115,305	.....
Sept.	14,380,430	10,273,750	71.4	390,840	289,596	307,103	105,088
Oct.	16,108,039	12,404,641	77.0	434,717	345,596	351,887	107,074
Nov.	13,598,280	10,526,226	77.4	399,897	294,290	272,477	88,971
Dec.	14,770,746	8,818,058	59.7	400,139	243,594	234,753	81,894
Total (yr.)	178,529,564	119,579,631	67.0	4,861,628	3,294,055	3,281,525	.....
1936							
January	370,319	229,064	61.9				216,040
February	343,024	226,216	65.9				193,919
March	356,763	237,601	66.6				204,376
April	356,829	245,738	68.9				204,353
May	356,463	241,895	67.9				213,435
June	359,359	241,656	67.2				218,330
July	371,692	249,402	67.1				219,042
August	359,360	268,770	74.8				207,886
Total (8 months)	2,873,809	1,940,342	67.5				.....
September	357,870	281,046	78.5				191,408
October	376,498	306,874	81.5				189,590
November	349,317	274,332	78.5				182,822
December	376,053	279,068	74.2				199,404
Total (Year)	4,333,547	3,081,662	71.7				.....
1935							
January	359,167	210,812	58.7				210,520
February	322,920	211,560	65.5				214,069
March	345,236	231,584	67.1				207,987
April	347,845	217,300	62.5				214,680
May	361,312	219,767	60.8				222,519
June	334,875	213,523	63.8				230,365
July	366,084	217,934	59.5				233,784
August	366,084	246,537	67.3				288,137
Total (8 months)	2,803,523	1,769,017	63.1				.....
September	337,395	244,963	72.6				220,998
October	373,312	288,668	77.3				214,685
November	345,005	246,318	71.4				213,297
December	344,705	196,429	57.0				211,029
Total (Year)	4,203,940	2,745,395	65.3				.....

PAPERBOARD
(.012 of an inch or more in thickness)
August, 1937

TABLE II.—CONSUMPTION AND STOCKS OF WASTE PAPER (85 MANUFACTURERS)

Year and Month	Consumption of waste paper (Short tons) Rated capacity	Consumed during month	Per cent of rated capacity	Stocks of waste paper at plants, end of month (short tons)
1937				
January	371,916	295,554	79.5	211,295
February	344,832	295,477	85.7	196,570
March	389,546	339,242	87.1	197,977
April	376,091	341,597	90.8	211,628
May	374,605	330,250	88.2	234,239
June	376,081	287,504	76.4	257,185
July	389,069	274,463	70.5	254,554
August	376,081	287,443	76.4	258,064
Total (8 months)	2,998,221	2,451,530	81.8	.....

Indianapolis Demand Hesitant

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., October 18, 1937—There appears to be a hesitancy in demand for some lines of paper that is causing the jobbers and manufacturers in this section to comment on the fact. A very few have advanced the theory that conditions in investment stocks have been responsible for this, but others point to the late fall and believe the decline in stock prices since summer have had little, if anything, to do with the matter. These feel the period between now and the holiday season will see the trade assume its normal proportions. As it is, practically all users are buying only for current needs and the general firmness of prices does not incline them to change this policy.

Books, covers and bonds have shown little change during the week. The demand is somewhat spotty, but jobbers say there is a seasonal volume of orders. Prices are firm. Printers say that while there are a lot of inquiries and much work in prospect, orders are rather hard to close, but direct mail advertising for the season is expected to be normal.

A good demand continues for all grades of building papers, not only in this city, but in all surrounding communities. Retailers do not have heavy stocks and are ordering for current needs. Newsprint demand also continues fair. The larger advertisers have shown no inclination to cut their lineage.

Paper stock demand is only fair. Local executives report a dull mill demand with most of the call for better quality rags and paper. Paying prices have shown no change.

Technical Association Papers for '34 & '36

Anyone having a copy of the above issues of Technical Association Papers who is willing to sell them please write the Book Department of the Technical Association of the Pulp and Paper Industry advising the price as a member is desirous of obtaining these issues.

NEWSPRINT INDUSTRY REVERSES ITS TREND

(Continued from page 11)

have been for the major part of this year. There has been no new mill construction in the newsprint field this year but installation of additional machines and resumption at mills that have been idle for some time have added to the productive capacity. This, naturally, has aggravated the conditions of over-production that have again become apparent in the industry. The prompt action of the short-tonnage mills in cutting down production is, consequently seen as a constructive step insofar as marketing conditions in the newsprint field are concerned."

Meanwhile there is, of course, the question as to the effect of these developments on the proposed $50 price for newsprint during the first six months of 1938, and on this question the view seems to be accurately summed up by the Montreal Gazette, which says: "In responsible newsprint circles here there is still confidence that the $50 rate announced for the first half of 1938 will be maintained and that regardless of Great Northern's decision, whatever it may be. It is contended that the time has passed when one unit can shape the policy of the whole industry. The matter of the newsprint industry's prosperity is something in which the provincial governments are very interested, and it is said that any tendency on the part of any company to cut prices to secure tonnage will be made so unprofitable by provincial intervention as to eliminate its possibility. That is the contention, and it appears to be well-founded, however much the market may doubt it."

Newsprint Production in Newfoundland

A despatch from Newfoundland, published here, says that operations at the Cornerbrook plant of International Power & Paper Co., Newfoundland, have been at capacity throughout the year.

While no interim report has been issued on current operations, it is generally understood that earnings are on a better basis than in 1936, partly due to increased production, but principally to the higher price for paper. Last year the company reported net sales of $7.7 millions, an increase of $1 million over the year before. Higher expenses, notably for wages, more than offset this gain and the drop in funded debt charges, with the result that there was a net loss for the year's operations of $364,179. On the other hand, this was a somewhat better showing than in 1935, when net loss, after depreciation and interest, amounted to $442,222.

There is a possibility, according to the despatch, that before long the company will take steps to increase the capacity of the Cornerbrook plant. For some time the I. P. of Newfoundland has been flirting with the idea of installing one or perhaps two additional machines. The matter has been under consideration, and it is understood that there is no obstacle, as far as power supply and wood are concerned to increasing capacity.

Another interesting development in connection with the company's operations has to do with the shipment of newsprint. In years past the company followed the practice of building up supplies during the winter months, when waterborne shipments are not possible. Recently the company made arrangements for establishing warehouse facilities in St. John permitting all year round shipments. This has made for more effective plant operation.

Price Raise in Britain

From London it is announced that British publishers have just confirmed the new schedule of prices for 1938 proposed recently by the British mills, according to private advices received here yesterday. For existing contracts running into 1938, the price has been increased by 30/— to £11 10s per long ton, which at the 4.95 rate of exchange, is equivalent to $51 per short ton. For new contracts, the tonnage involved in which will be small, the 1938 price has been set at £14 per long ton, which is equivalent at present exchange to $62.00 per short ton.

Quebec Raises Stumpage Dues

The Quebec Government has issued an Order-in-Council raising the stumpage dues for cutting rights on Crown lands. The duties will be made higher to the big concerns operating in the forests, while with a view to advancing the use of wood for fuel, particularly for the mining industry, which could be furnished by settlers and farmers, the Government reduces to 30 cents a cord the duty on wood of inferior quality.

The following are the chief provisions in the scale of duties as they affect pulp and paper and logging companies:

Wood cut on Crown lands concessions for pulp and paper, measured by cord (128 cubic feet): spruce, fir and grey pine, $1.25 a cord; spruce, fir and grey pine (barked up to the sap), $1.40 a cord; barked by knife or plane, $1.50 a cord; measured to 100 cubic feet solid, $1.75 a cord.

Saw wood: (logs of from eight to 18 feet in length to be sawed into planks): beech, elm, ash, lime, maple, walnut and cherry, $1.25 per 100 cubic feet; white and red pine, $1.00 per 100 cubic feet; tamarack, birch, grey pine, spruce and fir, 85 cents 100 cubic feet; aspen, poplar and cedar, 70 cents 100 cubic feet.

Square timber or half rounded: white pine, oak and walnut, 12 cents a cubic foot; red pine, elm, ash, lime, maple, tamarack and red spruce, 10 cents a cubic foot.

In the case of small saw mill owners having forestry concessions in Bonaventure, Gaspe South, Gaspe North and Charlevoix-Saguenay the following rates will prevail: Elm, ash, lime and maple $1.00 per 100 c.f.; white and red pine 85 cents 100 c.f.; grey pine tamarack, birch, spruce and fir 70 cents 100 c.f.; aspen, poplar and cedar 60 cents 100 c.f.

Wood cut on township reserves: Saw wood: elm, ash, pine and maple $1.25 for 100 c.f.; white and red pine $1.00 for 100 c. f.; grey pine, tamarack, birch, spruce and fir 85 cents 100 c.f.; aspen, poplar and cedar 70 cents 100 c.f.

Pulp wood, measured by cord: Spruce, fir and grey pine, $1.60 a cord 128 c. f.; spruce by plane, $1.90 a cord (barked to the sap), $1.80 a cord 128 c.f.; barked by plane, $1.90 a card 128 c.f.; other wood, $1.00 a cord 128 c.f.; other woods barked to the sap, $1.15 a cord 128 c.f.; measured to 100 c.f. solid spruce, fir and grey pine, $1.85 for 100 c.f.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, of Pulp and Paper Mills

General Construction News

Baltimore, Md.—The Gordon-Lavin Paper Box Company, Inc., 118 North Packer street, manufacturer of folding paper boxes and containers, has plans under way for new two-story addition to plant and will begin work on superstructure at early date. It is reported to cost over $40,000, including equipment.

Chicago, Ill.—The Isgo Wall Paper Corporation, 2115 West 21st. street, has awarded general contract to Max Rizinsky and I. Holzman, Chicago, for new two-story and basement addition to storage and distributing plant, recently referred to in these columns, to be 50 x 124 feet, estimated to cost about $45,000, with equipment. Work on superstructure will be placed under way at once. Dubin & Dubin, 127 North Dearborn street, Chicago, are architects.

Los Angeles, Cal.—The Johns-Manville Corporation, 22 East 40th street, New York, N. Y., manufacturer of insulating board, asbestos board and kindred products, has awarded general contract to the Joshua H. Marks-Charde Company, 816 West Fifth street, Los Angeles, for erection of proposed new plant at Alameda avenue and 283rd street, Los Angeles, previously noted in these columns, and work on superstructure has begun. The new mill will comprise two main units, each one-story, 100 x 700 feet, and 100 x 310 feet, respectively, with a wing extension to latter building, 60 x 90 feet, as well as other smaller structures for general utility service. It is estimated to cost close to $1,000,000, with equipment and is expected to be ready for operation early next year. Company also has awarded a number of sub-contracts, including lumber to the San Pedro Lumber Company, San Pedro; roofing and siding to the Economy Roof Company, 6416 La Riba way, Los Angeles, and for concrete pipe for sewage service to the United Concrete Pipe Corporation, 1347 West 208th street, Los Angeles. The Stone & Webster Engineering Corporation, 49 Federal street, Boston, Mass., and 601 West Fifth Street, Los Angeles, is engineer; Albert C. Martin, Higgins Building, Los Angeles, is consulting architect.

Port Clinton, Ohio.—The Celotex Corporation, 919 North Michigan avenue, Chicago, Ill., manufacturer of insulating board products, has acquired a controlling interest in the American Gypsum Company, Port Clinton, manufacturer of wall board and kindred specialties, and will be active in management in future. It is said that mill will be continued at present location under the new ownership and that expansion in operations will be carried out in the future. The Celotex company is operating on a capacity schedule at new branch mill at Metuchen, N. J., where production was recently placed under way and is now manufacturing two new specialties at this plant, including a cane fiber insulating board, particularly designed for light walls and partitions, and another board product to provide resiliency and sound-deadening service in connection with different character of building construction. Large production will be carried out for both of these products, Arthur Landis, formerly vice-president of the Auburn Automobile Company, Auburn, Ind., has become eastern manager for the Celotex Corporation, in charge of operations at the Metuchen plant; Floyd Adams is production manager at the mill.

Los Angeles, Cal.—The Dixie-Vortex Company, 421 North Western avenue, Chicago, Ill., manufacturer of paper cups and kindred paper specialties, has begun active work in connection with the establishment of its new branch plant at South Gate, Los Angeles, where a building has been acquired, as recently reported in these columns, and it is expected to have the plant ready for service before the close of this year. Facilities will be installed for employment of an initial working force of about 100 persons. New plant is estimated to cost over $150,000, instead of a smaller sum, previously noted.

Harpers Ferry, W. Va.—A water power site and water rights on the Potomac and Shenandoah Rivers, vicinity of Harpers Ferry, in which interest formerly was held by the Shenandoah Pulp Company, which has discontinued operations, has been acquired by the Virginia Public Service Company, Charlottesville, Va., and will be developed by that company in the future.

Mobile, Ala.—The Hollingsworth & Whitney Company, 140 Federal street, Boston, Mass., manufacturer of writing papers, kraft and other paper and board stocks, with main mills at Gardiner and Winslow, Me., has selected a tract of about 100 acres of land on the waterfront at Mobile, for proposed new pulp and paper mill. Plans for main units are scheduled to be prepared at early date. The plant will be equipped for employment of about 1,000 persons and is reported to cost close to $5,000,000, with machinery.

Pasadena, Tex.—The Champion Paper & Fibre Company, Houston Division, has further improvements under way at its new local bleached sulphate pulp mill to provide for increased capacity, developing a maximum output of 200 tons per day, for which plant originally was designed. The mill is now running on a basis of about 185 tons per day and will be stepped-up to the increased schedule in near future.

Port St. Joe, Fla.—The St. Joe Paper Company, affiliated with the Mead Corporation, Chillicothe, Ohio, has awarded contract to the Salmons Dredging Company, Charleston, S. C., for the installation of a 5-mile pipe line for water service for new pulp and paper mill, now in course of erection. Work will be placed under way at once. Superstructure work for main units of plant is well in progress and the project will be pushed to completion at earliest date. It will be equipped for a capacity of 350 tons daily and will represent a total investment of about $6,000,000. James Stewart & Co., Inc., 230 Park avenue, New York, N. Y., is general contractor. George F. Hardy, 305 Broadway, New York, is consulting engineer. Sydney Ferguson, vice-president of the Mead Corporation, is president of company.

Chicago, Ill.—The Ansell Simplex Ticket Company, 2844 West Chicago avenue, manufacturer of card and paper specialties, has awarded general contract to the Robert G. Regan Company, 228 North LaSalle street, Chicago, for new two-story and basement addition to plant, 25 x 150 feet, and erection will be placed under way at once. It will cost over $50,000, with equipment. W. Fred Dolke, 189 West Madison street, is architect.

Dayton, Ohio—The Reynolds & Reynolds Company, 931 Washington street, manufacturer of paper specialties, has completed plans and is arranging early call for bids on general contract for new two-story and basement addition to plant, previously referred to in these columns, to total about 30,000 square feet of floor space. The majority of structure will be used for expansion in production, with remainder given over to office and operating service. It is reported to cost close to $75,000, including equipment. Schenck & Williams, Third National Bank Building, Dayton, are architects. E. S. Reynolds, Jr., is president.

Bogalusa, La.—The Bogalusa Paper Company, Inc., manufacturer of kraft paper stocks, has work in progress on expansion and improvements in mill, including installation of equipment in different departments for increased output, comprising pulp-washing, chemical, lime and other divisions. Entire project will represent an investment of about $400,000, and is scheduled for completion by the close of the year. Company is affiliated with the Gaylord Container Corporation, 2820 South Eleventh street, St. Louis, Mo.

Fort William, Ont.—The Vermillion Lake Pulp Company, Ltd., care of A. H. Dowler, Fort William, recently organized, has preliminary plans under way for construction of a new sulphite pulp mill in vicinity of Sioux Lookout, near Fort William. It will comprise several one and multi-story units, to be equipped for an initial capacity of about 100 tons per day, and is reported to cost close to $2,000,000, with equipment.

Sydney, Australia—Fibrerock Pty., Ltd., Sydney, New South Wales, recently organized, has plans maturing for new local plant for the manufacture of a wood fiber-cement product for insulating service, produced as a board specialty. New plant will be one-story, reported to cost over $75,000, with equipment. It is proposed to begin erection soon.

New Companies

New York, N. Y.—The Schultz Box Company, Inc., has been incorporated with capital of $10,000, to manufacture and deal in paper boxes and containers. Albert E. Schultz, 19 Cedar street, New York, is principal incorporator and representative.

Paterson, N. J.—Thomson Brothers, Inc., has been chartered with capital of 1,000 shares of stock, no par value, to deal in paper products of various kinds. Benjamin F. Thomson, Paterson, is principal incorporator and company representative.

New York, N. Y.—The Allvue Container, Inc., has been organized with capital of 100 shares of stock, no par value, to deal in paper containers and allied products. New company is represented by Albert A. Burdick, 239 Broadway, New York, attorney.

Lynn, Mass.—The Lynn Paper Stock Company, 44 Charles street, has filed notice of company organization to deal in waste paper products. Sidney Michelson, 36 Sagamore street, is head.

Local 152 Wins at Covington

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 20, 1937.—On the results of a secret ballot held September 28, the National Labor Relations Board has certified that Local 152, International Brotherhood of Pulp, Sulphite & Paper Mill Workers, is the exclusive representative of all employees at the Covington, Va., mill of the West Virginia Pulp and Paper Company, except employees paid on a salaried basis.

The case arose on a petition of Local 152, filed with the Board's Regional Office at Baltimore on July 2, which asked the Board to investigate a representation dispute between itself and the Employees Protective Association, a labor organization likewise claiming to represent employees at the Covington plant. On the record of a hearing held August 16 before Trial Examiner James G. Ewell, the Board directed that an election be held with the names of the rival claimants on the ballot. The results of the secret ballot were as follows: Eligible, 1,599; cast, 1,494; for Local 152, 928; for association, 525; for neither organization, 41.

Mill Superintendents To Meet

The fall meeting of the New York-Canadian Division of the American Pulp and Paper Superintendents Association, will be held at the Queensbury Hotel, Glens Falls, N. Y., October 29-30. George K. Walker, chairman, states the recreation program will provide for both ladies and gentlemen. The program follows: Friday, October 29: Registration and mill visits to Imperial Wall Paper & Color Works, and local paper mills. Golf tournament and bowling contest, with a cruise on Lake George for the ladies. Banquet at the hotel with dancing. Guest speaker, John Cornell, on "The Business Outlook for the paper business." Saturday, October 30: Meeting of divisional officers and business meeting, followed by lunch. In the afternoon, sports, ladies' bridge luncheon, ending with a banquet and dance.

General Fibre Box Co. Builds

[FROM OUR REGULAR CORRESPONDENT]

WEST SPRINGFIELD, Mass., October 18, 1937.—Several additions to the factory of the General Fibre Box Company here include provision for a shop and boiler house. They will be one story each and of brick construction.

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COMING EVENTS IN THE PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY—Fall Convention, DeSoto Hotel, Savannah, Ga., Oct. 18-20, 1937.

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION, Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park-American Hotel, Kalamazoo, Mich.

MOUNTING TAXES

In the last fiscal year ended September 27, the gross income of the Federal Government increased 4.6 billions, an increase of 32 per cent over the preceding year. Improved business conditions and higher taxes added more than a billion dollars to the Treasury of the United States. Interpreting the internal revenue collections for the year ended June 30, 1937, a treasury report stated that this amount increased $1,132,986,000, or 32.2 per cent over a corresponding period in the previous year. Collections totaled $4,653,195,000.

The treasury report attributed the increase to continued improvement in business, changed provisions and higher rates of tax on individual and corporate incomes and estates and to the new levies on payrolls as provided in the Social Security Act. Income taxes provided $2,148,663,000 of the internal revenue aggregate, an increase of 52 per cent over the previous year.

The corporation income levy gained 43 per cent in the same period, while the tax on individual incomes contributed 62 per cent. The increase is stated to be due, in part, to the 1936 Revenue Act, which imposed the surtax on undistributed corporate profits. This tax, which tended to increase dividend distribution, increased the taxable income of security holders. In addition to this, individuals paid higher surtax rates in the higher bracket incomes for last year.

In reference to the surtax on the undistributed profits of corporations, the chief objection of business men to the tax in its present form, is that it discourages the accumulation of reserves to meet emergency expenditures, which practice has long been regarded as prudent provision for such future contingent expenses as are likely to arise in the normal conduct of almost all types of businesses. It also discourages the "ploughing back" or reinvestment of company funds for the healthy growth of the business. The expansion of such enterprises as Ford and Woolworth founded, to mention but two instances, were built upon and are still conducted on the sensible principle of reinvesting reserves to expand their volume, rather than to depend upon outside financing for such legitimate purpose.

In considering briefly the inportance of this mounting load of taxes, it may be noted that New York provided $988,090,000 of the total internal revenue, or 21.24 per cent. Illinois followed with $409,693,000, or 8.81 per cent, and Pennsylvania with $399,877,000, or 8.58 per cent. South Dakota contributed the smallest amount of all the states with $1,626,000, or 0.04 per cent of the total.

But the tax load indicated by these few figures of the income of the Federal Government, is not all of the burden which all of us, in a measure, must bear. In most cases, the Federal Government imposes heavy taxes on the same sources as the most important taxes which contributed 84 per cent of the revenue derived by New York State in 1936.

First, is the personal income tax, on which Federal rates are graduated up to as high as 79 per cent. The maximum corporation tax in New York is 6 per cent, while the Federal Government tax has a top rate of 15 per cent, to which must be added an additional tax on undistributed profits rising as high as 27 per cent. The State estate tax is graduated to 20 per cent on the largest incomes, while the Federal rates go up to 70 per cent, with a credit against the Federal levy of 16 per cent, if paid to a State.

It is this duplicate and conflicting taxation between the States and the Federal Government, to which Governor Lehman called attention in his address on September 15, at the opening of the Governors' Convention in Atlantic City, attended by the heads of nineteen states. He said in part: "The right of the States to tax rests on as solid a foundation as does the authority or the power of the Federal Government. Assuming, for instance, that an American state should decide to tax personal incomes as high as the Federal Government taxes them, what would be the result? The answer is simple. The combined taxes would be unbearably high. They

would discourage individual initiative and adversely affect the economy of the nation. Moreover, a taxpayer with an income of $250,000 would find his tax bill $256,500, or $6,500 more than his income! You will say that such a situation is extremely unlikely. To that I agree. But when I tell you that in two states the combined Federal and the State rate is 94 per cent of all income above a certain amount, and in another 90 per cent above $12,000, you see the situation is serious.

"Before it is too late, we should consider the effects and consequences of conflicting taxation. The new money needed to pay the aggregate cost of Federal and State government, should be raised in such fashion as to secure a reasonable distribution of the load and avoid discouraging the development or enlargement of business enterprises. Unless this is done, the economic interests of the nation suffer as well as the interests of the groups directly affected.

"The assets of a nation," Governor Lehman pointed out, "consist of its material wealth, natural resources and, as well, the creative, constructive, inventive genius of its people. If two governments with concurrent jurisdiction, lay taxes so high in the aggregate as to discourage the individual, his ability is withdrawn from the business field and the country loses a valuable asset.

"Nevertheless, as things now stand," he continued, "every American state, I suspect, is finding it difficult to finance its operations and the expenses of its localities, without resorting to the enactment of tax laws inimical to the economic interests of the State. And that is probably due to the fact that the national government is almost monopolizing so many of the important tax fields.

"If I see the situation clearly we, the states and the national government, should inaugurate plans for coordinating Federal, State and local revenue systems. We owe that duty to the taxpayers. We can improve the present situation only through effective and close cooperation between the Federal and State governments and between the several States themselves. Without such cooperation we will accomplish nothing."

Continental Gets Tax Reduction

[FROM OUR REGULAR CORRESPONDENT]

A tax decision made at Menominee, Mich., favors the Continental Bag and Paper Company, whose idle mill at that city was reduced in assessment from $85,000 to $35,000. The Union Falls Power Company, a subsidiary, had its assessment reduced from $300,000 to $265,000. The board of tax review had boosted the total assessment of the two properties to $385,000 after the company had petitioned that they be assessed separately, and an appeal was made to the Michigan tax commission. The total assesment is still $50,000 above last year, when it was fixed at $250,000.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Months	1937	1936	1935	1934
January	90.3%(c)	76.1%	65.8%	.....
February	90.1%(c)	77.9%	70.0%	.....
March	90.3%(c)	76.0%	70.5%	.....
April	92.1%(c)	82.3%	70.0%	.....
May	90.6%(c)	81.6%	69.4%	.....
June	87.3%(c)	80.7%	72.3%	.....
July	81.8%(c)	77.3%	64.9%	.....
August	82.9%(c)	81.5%	70.9%	.....
September	78.4%(c)	80.5%	71.9%	58.2%
October	.....	87.6%	75.6%	64.7%
November	.....	88.0%	75.3%	61.7%
December	.....	85.9%	71.2%	59.6%
Year Average	.....	81.3%	70.5%	.....
Year to Date				
First 40 weeks	86.7%	79.4%	69.6%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1937		CORRESPONDING WEEKS, 1936	
*September 4	80.7%	September 5	81.0%
*September 11	(h)68.7%	September 12	(h)71.2%
*September 18	82.7%	September 19	85.7%
*September 25	82.0%	September 26	84.3%
*October 2	77.7%	October 3	85.3%
*October 9	73.2%	October 10	87.1%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting, Current Weeks					
Ratio Limits	Sept. 4, 1937	Sept. 11, 1937	Sept. 18, 1937	Sept. 25, 1937	Oct. 2, 1937	Oct. 9, 1937
0% to 50%	71	107	85	82	78	69
51% to 100%	247	211	228	228	213	140
Total Mills Reporting	318	318	313	310	291	209

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours," were as follows:

Mos.	1937	1936	1935	1934	Mos.	1937	1936	1935	1934
Jan.	80%(e)	61%	61%	....	July	67%(e)	69%	59%	....
Feb.	86%(e)	67%	67%	....	Aug.	74%(e)	75%	65%	....
Mar.	87%(e)	68%	67%	....	Sept.	....	76%	69%	62%
Apr.	89%(e)	70%	61%	....	Oct.	....	82%	76%	63%
May	86%(e)	68%	61%	....	Nov.	....	79%	70%	56%
June	75%(e)	68%	65%	....	Dec.	....	74%	60%	52%

Week end. Sept. 4, 1937—73%
Week ending Sept. 11, 1937—59%(h)
Week end. Sept. 18, 1937—73%
Week end. Sept. 25, 1937—70%
Week end. Oct. 2, 1937—71%
Week end. Oct. 9, 1937—67%

(e) Basic figures revised to include new members of the National Paperboard Assn.
(h) Holiday week: percentages based on six days' operation.

W. C. Sisson Speaks on Industry

[FROM OUR REGULAR CORRESPONDENT]

POTSDAM, N. Y., October 18, 1937—In an address here last week before the local Rotary Club, Walter C. Sisson, of the Racquette River Paper Company, declared that private interest must defend itself today. He reviewed economic conditions during the World War and spoke of the various organized labor movements in this country and Europe. He said that the aims of labor may be summarized as recognition from leading industries for C.I.O. unions, extend membership to a majority of workers within each plant or industry, establish the employer check-off system for payment of union dues, come to terms with the A.F.L. by 1939, elect a president in 1940, and claim the right of labor to participate in corporation management. It is his belief that what is needed today above all is a sounder understanding of the relation of wage rates to profits, to prices, to production and to employment.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Raw Materials

Density Studies of Eastern Canadian Spruce and Balsam: A summary Progress Report. J. D. Hale and J. B. Prince. Pulp Paper Mag. Can. 38: 150-151 (1937).—A brief itemization of figures for density obtained on pulpwood samples from various regions across Canada from the west end of Lake Superior to Nova Scotia.—A.P.-C.

Present and Possible Uses of Birch and Other Hardwoods on Pulpwood Limits. T. A. McElhanney et al. **Occurrence of Birch and Poplar on Pulpwood Lands.** Roland D. Craig. Pulp Paper Mag. Can. 38: 137-138 (1937).—An estimate is given of the stand of accessible birch and poplar in eastern and central Canada.—A.P.-C.

The Production of Paper From Cereal Straws. The Utilization of Agricultural Wastes for the Production of Miscellaneous Fabricated Materials. Edward R. Whittemore, Iowa State Coll. J. Sci., 11: 131-133 (1936).—The possibility of manufacturing paper from the 220,000,000 tons of agricultural cellulose wastes was investigated with the kraft, soda and other commercial processes. The cortex fiber of cornstalks gelatinizes abruptly, making it particularly useful in making glassine papers. Papers, from wrapping to bond and glassine, can be made from cereal straws and cornstalks. The strength of paper varies from the strongest with oat straw through barley and wheat to the weakest with rye straw. Bleachability varies in the reverse order. The use of a rotary continuous digester with recirculation of digesting liquors is advised. The digestion can be controlled by controlling steam consumption. Quality of the paper was controlled by the microscope with transmitted light and moderated modification. Cornstalk pith and cortex can be separated by either wet or dry processes. The cortex is satisfactory for cellulose uses. The pith has a higher insulation value than cork. Cornstalk pressboard can be molded into unit structures stronger than wood. By the use of solvent sizing pressboard can be made resistant to moisture. Moisture content can be determined by electric conductivity.—A.P.-C.

Chemical Constituents of Actinidia Callosa Lindl. Var. Rufa Making. I. Yoshijiro Kihara. J. Agr. Chem. Soc. Japan 12: 721-725 (1936).—The mucilage of *Actinidia callosa* Lindl. var. rufa Makino has been used for paper making in the southern part of Japan. The bark contains 8.88 per cent water, 0.89 per cent ether extract, 0.38 per cent unsaponifiable in the ether extract, 19.89 per cent total soluble carbohydrates, 10.20 per cent pentosans, 64.56 per cent crude fiber, 6.52 per cent ash, 0.50 per cent nitrogen and 1.92 per cent tannin. The carbohydrates consist mainly of the mucilage (soluble in cold water) and a pentosan which was extracted by heating with water at 140°C. The mucilage was dydrolyzed to 4.4 parts of galactose and 1 part of arabinose. It may be an arabogalactan. It was preciptitated from queous solution with barium hydroxide or Fehling's solution. No precipitate was obtained by saturating with ammonium sulphate. It was easily hydrolyzed by the enzyme of snail extract, while take diastase had no action. The pentosan gave arabinose only by hydrolysis. A large amount of calcium oxalate crystals was observed in the bark. Tannin belonging to the pyrocatechol group was obtained.—A.P.-C.

Constitution of Cellulose and of Wood. E. Coffari. Chem. E. L'Ind. 18: 565-567 (1936).—A review of recent work, mainly that of E. Schmidt and his co-workers.—A.P.-C.

Wood Substances. V. Yield and Properties of Cellulose From Manchurian Conifers. K. Nishida and R. Miyama. J. Cellulose Inst., Tokyo, 12: 326-331 (1936).—Details are given of sodium sulphite cooks and of the properties of the resultant pulps.—A.P.-C.

One Phase of the Effect of Wood Quality on Sulphite Pulp. Vance P. Edwardes. Paper Trade J. 104, No. 8: 120, 122 (Feb. 25, 1937).—Plotting month by month the percentage consumption of three different wood classifications (as obtained from the mill yard records) and the unbeaten Mullen test of the paper showed remarkable analogy in the two curves, showing that wood quality is the most important ingle variable affecting pulp quality and that of the paper.—A.P.-C.

Process of Deinking Paper Printed With Oxidizable Inks. Pierre R. Hines. Fr. pat. 804,910.—Paper printed with oxidizable inks is treated to remove size (suitably with 40 to 60 lbs. of caustic

soda per ton of air-dry paper). The liquor is removed, and the shreds are maintained in loose condition and moist with weak alkali solution and exposed to the air until brown spots appear on the shreds. The latter are then again covered with a weak alkaline solution so as to exclude further direct contact with air till the ink particles are readily detachable by slight brushing. The shreds are then subjected to defiberizing action and the ink particles removed, suitably by a flotation process.—A.P.-C.

Mechano-Thermo-Chemical Treatment of Peat for the Production of Pulp and By-Products. G. Lochenies and J. Wingen. Belg. pat. 417,458 (Oct. 31, 1936).—Peat is crushed between cylinders, cooked under pressure in a rotary boiler, first with caustic soda and ammonia and then with sulphuric acid, washed, bleached with sodium hypochlorite and then with sodium thiosulphate. The cooking waste liquor is used as fertilizer.—A.P.-C.

Rags

Theoretical Examination of the Thrashing Machine. G. F. Korobkov. Bumazhnaya Prom. 15, No. 10:45-49 (Oct., 1936); C. A. 31:2426.—A mathematical discussion of the performance of a thrashing apparatus for dusting and cleaning of rags in production of paper.—C.J.W.

Utilization of the Phenomena of Mechanical Resinance in the Construction of Sorting Machines. G. M. Zharnitskii. Bumazhnaya Prom. 15, No. 6: 69-72 (June, 1936); C. A. 31:24-26.—The application of the mechanical resonance phenomena to various types of vibrating and pulsating apparatus in the paper industry is recommended for practical study (cf. British patent 413,689).—C.J.W.

Sorption of Water and Alcohol Vapors by Cellulose. J. K. Russell, O. Maass and W. Boyd Campbell. Can. J. Research 15B: 13-37 (1937).—Measurements were made of the amount of water vapor sorbed by beaten and unbeaten samples of kraft, unbleached sulphite and bleached sulphite wood pulps at relative vapor pressures ranging from 0 to 100 per cent. Beating of the pulp made practically no difference to the degree of sorption at any relative vapor pressure. This indicated that beating caused no change in the hydration of the cellulose. Measurements were made of the sorption of methyl alcohol vapor by bleached sulphite, kraft and groundwood, and of the sorption of propyl alcohol vapor by bleached sulphite and cotton, all previously wetted with water and then dried. After sorption of alcohol, evacuation at room temperature did not completely remove the alcohol. Measurements were also made of sorption of propyl alcohol by bleached sulphite and by cotton which had been dewatered by washing with propyl alcohol. The shape of the sorption curve was different for these samples, and the residual alcohol after evacuation was less. After a sample of cotton had been dried over phosphorus pentoxide in vacuo for a long period it was found to hold 0.35 per cent of water by weight, which could be removed by heating the cellulose to 100°C. This was regained from the pentoxide on cooling. The data are explained on the hypothesis that the crystalline submicroscopic elements of the cellulose structure are drawn together by internal tensile forces during the evaporation of the sorbed liquid, and that bonding between these elements may take place by the growing together of the crystal elements, leaving the structure internally stressed. On absorption, dissolution of these bondings takes place and the stresses are relieved as liquid enters the structure.—A.P.-C.

Lyophilic Properties of Cellulose and Its Derivatives. IV. Hydrophilic Properties of Electropositive Cellulose Fibers. K. Kanamaru and T. Nakamura. J. Soc. Chem. Ind. Japan 39:338-346B (1936).—When cellulose fibers are rendered electropositive by adsorption of aluminum hydroxide the hygroscopicity is diminished and the breakdown voltage increased. The best result is obtained by steeping in 17 to 18 per cent sodium hydroxide, pressing between filter paper, steeping in 10 per cent aluminium sulphate for 3 to 4 hrs. at 40°C. at a tension of 30 per cent of the breaking stress, washing, and drying at 100° to 105°C.—A.P.-C.

Lyophilic Properties of Cellulose and Its Derivatives. V. Hydrophilic Properties of Electroneutral Cellulose. K. Kanamaru and T. Nakaramura. J. Soc. Chem. Ind. Japan 39: 346-250B (1936).—When the amount of aluminum hydroxide absorbed from aqueous aluminum chloride increases, the zeta-potential rises through zero to positive values; the zero value correspond with a minimum hygroscopicity and a maximum breakdown voltage.—A.P.-C.

The State of Solution of Highly Polymerized Organic Compounds, Particularly of Cellulose. I. II. Gi-iti Saito. J. Soc. Chem. Ind. Japan 39: 351-353B (1936).—A comprehensive discussion of the available literature data. The loosely coiled shape of the molecules appears to be the most probable one. The characteristic properties of the solutions of highly polymerized natural substances, especially cellulose and its derivatives, are determined by the differences in the elasticity of the molecular chains and the existence, number and position of atomic groups with strong cohesive forces.—A.P.-C.

The Synthesis of Wood and Cellulose Fiber. D. Kruger. Zellstoff u Papier 17, No. 1: 9-13 (Jan. 1937).—By means of over fifty references to the literature, the author describes recent studies on the morphology of wood and cellulose fibers and the principal constitutents of the wood fiber.—J.F.O.

Cellulose

Highly Polymerized Compounds. 153. The Constitution of Cellulose. H. Staudinger. Svensk Kem. Tid. 49, No. 1: 3-23 (Jan., 1937).—A review is given of the work, mainly of Staudinger and his co-workers, on the constitution of cellulose. 63 references are given.—C.J.W.

The Significance of Explaining the Constitution of Cellulose for the Rayon Industry. Melliand Textilber. 18, No. 1: 53-57 (Jan., 1937).—The author discusses the effect of the degree of polymerization of cellulose on the physical properties of rayon. —C.J.W.

Homogeneity of Native Celluloses and Their Derivatives. II. A. Sakostschikoff and D. Tumarkin. Melliand Textilber. 18, No. 1: 57-59 (Jan., 1937).—The quantity of cross elements present in various native fibers is estimated and found to be: in raw cotton, up to 0.5 per cent; in purified cotton, 0.07-0.18 per cent; in unbleached kendyr, 0.7 per cent; in unbleached pulp, 1.3 per cent; and in bleached pulp, 0.07-0.09 per cent.—C.J.W.

The Fundamentals of Glassine Transparency*

Part I. Psychological

By Dan B. Wicker[1]

Abstract

A study has been made of the fundamentals of glassine paper transparency. In this, the first of a series of three papers on this subject, the psychological aspects of the problem are discussed. The other studies will cover the instrumental aspects, including the development of an apparatus for measuring the property of these papers.

Photographs of a group of glassine papers and visual rankings of these samples by various observers are presented, with the conclusion that such ranking is not dependable, except for papers which differ by fairly large transparency increments. Selecting several widely different samples, the transparency was found to increase progressively with the tendency of the sheets to transmit light without scattering. An analysis of the visual sensation of transparency is developed in the light of this relationship. An analysis of the concepts of transparency and opacity as applied to paper is given. Mathematical equations representing the visual reaction to changes in brightness contrasts when a printed surface is covered by a transparent sheet are developed. Sharpness of resolution of the image when viewing an object or surface at some distance removed is pointed out as the prime essential to transparency. It is concluded that the capacity for transmitting rays of light without scattering is the single property of a sheet which dominates all others in determining transparency.

In reviewing and analyzing the fundamental properties and processes which have a bearing upon the transparency of glassine paper, it is essential that one begin with a clear conception of the nature of the phenomenon, and a full appreciation of the limitations and difficulties connected with its study. In the strictest sense of the word, transparency is a subjective, rather than an objective, quality. Webster defines the term as "the property of transmitting rays of light so that bodies may be distinctly seen through." In the final analysis, this definition specifically limits the observation of transparency to the reactions of the human organs of sight, and presents the usual difficulties of dealing statistically with a subjective property. However, the framer has, with remarkable acumen, left open the possibility that there is a particular manner of transmitting rays of light which produces the phenomenon in question. Thus, if one can establish such a manner of transmission which is peculiar to transparent substances and can evaluate the factors which enhance or retard the process, he conceivably may be able to treat transparency on a purely objective basis.

When this subject was first considered, the greatest obstacle was found to be the lack of a dependable and sufficiently sensitive means of measuring the degree of transparency in numerical terms. Thus, the first and major efforts were directed toward developing and perfecting a device for such measurement which would distinguish small differences in quality. This statement does not indicate a lack of appreciation of the value of the several excellent instruments for measuring paper opacity. These are admirably suited for measuring the tendency toward imperviousness to the passage of rays of light of relatively opaque sheets. The problem at hand was found to be one of measuring a particular manner of light transmission in cases which involve much less opacity than those for which the instruments in question are normally used.

Visual Grading of Samples

Obviously the initial step in arriving at a definite conception of those properties which give rise to the reactions attendant to transparency was to collect a group of samples and have them graded visually by various observers in relative order of quality. Such a group of samples was collected from various producers and, when completed, represented cellophanes, glassines, and supercalendered waxing papers (not waxed) of basis weights between 18.8 and 26.5 pounds (24" x 36" — 500). Only white or slightly tinted papers were included. A permanent record of the transparent characteristics of the samples was made by photographing a Government Printing Office opacity test sheet with a sheet of each paper interposed. Conditions were very carefully standardized to insure that the photographs obtained were truly indicative of the paper properties and that they were not affected by variations in illumination, exposure, or development. The accompanying "photographic series" (Fig. 1) shows the relative properties of the sheets as extending from almost perfect transparency to considerable opacity. In estimating the

TABLE I.—VISUAL RANKING OF TRANSPARENT SAMPLES*
(Cellophane not Included)

	Sample as found by observer								
Rank	I	II	III	IV	V	Visual Consensus	Preference	Cumulative Net Preference Score	Photographs (Fig. 1)
1st	3-O	3-O	3-O	3-O	3-O	3-O	5:0	88	3-B
2nd	3-B	3-C	3-C	3-C	3-C	3-C	4:1	83	3-O
3rd	3-C	3-B	3-B	3-B	3-B	3-B	5:0	80	3-C
4th	6-B	6-B	6-B	6-B	1-S	6-B	4:1	75	6-B
5th	4-B	4-B	4-B	1-S	4-B	4-B	3:2	72	4-B
6th	1-S	1-S	4-D	4-B	6-B	1-S	4:1	71	1-S
7th	1-W	4-D	1-S	1-W	4-D	4-D	3:2	68	4-D
8th	1-G	1-W	6-D	1-G	1-W	1-W	5:0	67	1-W
9th	6-D	6-D	1-W	4-D	1-G	1-G	3:2	62	6-D
10th	4-D	1-G	1-G	6-D	6-D	6-D	5:0	61	1-G
11th	6-A	4-A	4-A	4-A	6-A	4-A	3:2	56	4-A
12th	4-A	6-A	6-A	6-A	4-A	6-A	5:0	55	6-A
13th	5-A	4-E	4-E	5-A	4-E	4-E	3:2	50	4-E
14th	1-B	5-A	5-A	4-E	6-F	5-A	4:1	49	6-F
15th	6-F	6-F	2-A	6-F	5-A	6-F	4:1	46	1-B
16th	4-E	1-B	6-F	1-B	W-C	1-B	4:1	43	5-A
17th	7-A	7-A	1-B	7-A	W-6-C	7-A	4:1	40	W-6-C
18th	2-A	2-A	7-A	W-C	7-A	2-A	3:2	37	7-A
19th	W-C	W-C	W-C	2-A	2-A	W-C	5:0	36	W-C
20th	W-6-C	W-6-C	W-6-C	W-6-C	1-B	W-6-C	5:0	31	2-A
21st	W-G	W-G	W-G	W-G	W-B	W-G	4:1	26	W-B
22nd	W-B	W-H	W-B	W-A	W-H	W-B	4:1	23	W-H
23rd	W-A	W-B	W-H	W-B	W-G	W-H	3:2	20	W-G
24th	W-H	W-A	W-A	W-6-E	W-A	W-A	5:0	19	W-6-E
25th	W-6-E	W-6-E	W-6-E	W-H	W-M	W-6-E	4:1	14	W-A
26th	W-M	W-M	W-M	W-M	W-6-E	W-M	5:0	11	W-M
27th	W-D	W-D	W-D	1-OP	1-OP	W-D	3:2	6	W-D
28th	1-OP	1-OP	1-OP	W-D	W-D	1-OP	5:0	5	1-OP
29th	W-E	W-E	W-E	W-E	W-E	W-E	...	0	W-E

* Code numbers beginning with *W* represent waxing sheets; all others are glassines.

* Presented in part at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York City, Feb. 22-25, 1937.

A portion of a thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the Degree of Doctor of Philosophy from Lawrence College, Appleton, Wisconsin, June, 1935.

[1] Member TAPPI, Chief Chemist, Thilmany Pulp & Paper Co., Kaukauna, Wis.

properties of these sheets, it is well to bear in mind that they were not in direct contact with the opacity test sheet, but were separated from it by about one-fourth inch, being held flat between two pieces of plate glass.

Five observers made independent rankings of the sheets. The conditions of observation were to view a black and white printed surface which was covered with the samples held between plates of glass. The illumination for each observer was the same. Table I gives the results for this ranking along with the ranking as found by observation of the Photographic Series.

An examination of the data shows considerable discrepancy between the opinions of the various observers. This condition may have been brought about by inaccurate observation of definite differences in transparency, or it may have been due to inclusion of samples which were too nearly alike for accurate differentiation. In either case it is necessary to use some systematic method of arriving at a ranking which is based upon the consensus of opinion. The following line of reasoning was adopted. Sample 3-0 was considered most transparent by all five observers. This definitely places it first with a 5:0 preference. The next best sample was either 3-B or 3-C. Four observers considered 3-C as better, while one favored 3-B. This placed 3-C second with a 4:1 preference. Sample 3-B was ranked third, since by agreement of all five observers it was better than all samples other than 3-0 and 3-C. In a similar manner 6-B was placed fourth with a 4:1 preference over 4-B, etc.

It is to be observed that there are eight pairs of samples in which the preference was determined by 3:2 decisions, and ten pairs in which the preference was agreed upon by all observers. There is no reason to assume that there was a definite increment of transparency between the various papers, or that different papers of identical transparencies might not have been included. Samples were taken as received with no attempt at arbitrary selection. However, it is logical to assume that where all observers agreed in the relative rankings of two papers there was an obvious and fairly large difference in transparency; where the observers did not agree, it may have indicated differences in transparency which were very small. In order to present the data in a form which indicates the preponderance of opinion upon which the visual consensus ranking was based, a "cumulative net preference score" was calculated. Attributing zero to W-E, the poorest sample in the series, the next one, 1-OP, was scored 5 to indicate that all five observers considered it more transparent; W-D, with a 3-2 preference, was scored 6 to indicate that it was considered more transparent than 1-0P by the deciding opinion of one observer. In similar manner W-M was scored 11, indicating a 5:0 preference, and W-6-E, 14, based on a 4:1 preference. The net preferences accumulate to a total of 88 for 3-0, the most transparent sample. These values are by no means quantitative measurements of transparency. They merely indicate the relative order of ranking from poorest to best, just as "first," "second," "third," etc., indicate the ranking from best to poorest. Those samples which have scores differing but little in value are presumably not far different in transparency, while larger increments in score indicate greater transparency intervals. The purpose of the score is to indicate these distinctions instead of ignoring them as would be done with the ordinary manner of ranking.

Further analysis of the data indicates that not only do observers fail to agree with each other, but no one agrees exactly with the consensus, and the consensus fails to agree with the ranking as found by observation of the photographs. The immediate conclusion might be that the samples were too nearly alike to permit accurate differentiation. However, discrepancies appear where there seem to be definite differences between samples. Thus, both photographically and judged by the visual consensus, sample 1-B is more transparent than 7-A or 2-A. Yet one observer considered it poorer than 2-A and another considered it poorer than either 7-A or 2-A. Also, the various observers placed it in ranks from fourteenth to twentieth. To summarize, out of 140 decisions 114 or 80 per cent are in agreement. Thus, even with identical conditions of observation, the personal element colors the results to a large extent.

Further confirmation of this conclusion is found in a similar study by The Institute of Paper Chemistry. Twenty-three glassine and waxing samples were sent out to various persons in the industry for ranking; the results are given in Table II[2].

[2] Institute of Paper Chemistry. PAPER TRADE J. ..., ..., ... (Instrumentation Series XVII.)

TABLE II.—VISUAL RANKING OF TRANSPARENT SAMPLES AS OBTAINED BY THE INSTITUTE OF PAPER CHEMISTRY

	Sample No. as found by Observer											Visual Consensus	Cumulative net Preference	Score Preference
Rank	A	B	C	D	E	F	G	H	I	J	K	As calculated by the Author		
First	4	4	4	4	3	4	4	4	4	3	4	4	9:2	128
Second	3	3	3	3	4	3	19	3	3	4	13	3	9:2	121
Third	19	9	19	19	19	19	3	19	5	19	19	19	10:1	114
Fourth	5	19	5	9	13	13	5	5	20	5	20	5	9:2	105
Fifth	13	5	9	13	5	10	20	20	19	9	5	9	6:5	98
Sixth	9	10	13	5	9	5	13	9	9	10	3	13	9:2	97
Seventh	20	20	10	14	10	9	9	13	13	20	9	10	6:5	90
Eighth	14	12	20	10	14	14	10	10	10	12	10	20	8:3	89
Ninth	10	14	14	20	20	20	14	14	14	13	7	14	8:3	84
Tenth	12	13	12	12	12	12	12	12	12	7	12	12	10:1	79
Eleventh	7	6	6	7	6	6	7	7	6	6	6	7	6:5	70
Twelfth	6	7	7	6	7	7	6	6	7	14	14	6	11:0	69
Thirteenth	16	15	15	15	15	15	15	15	15	15	16	15	9:2	58
Fourteenth	16	15	17	16	16	16	16	16	16	22	15	16	10:1	51
Fifteenth	17	22	16	24	17	17	25	25	25	25	25	17	6:5	42
Sixteenth	24	17	22	17	22	22	17	22	22	16	22	22	6:5	41
Seventeenth	22	11	11	11	24	11	22	17	17	24	24	25	6:5	40
Eighteenth	25	18	18	25	18	24	24	11	11	17	11	24	6:5	39
Nineteenth	11	23	24	22	25	25	11	24	24	18	17	11	9:2	38
Twentieth	18	25	25	18	11	18	18	18	18	11	18	18	11:0	31
Twenty-first	23	24	23	23	23	23	23	21	23	23	23	23	10:1	20
Twenty-second	21	21	21	21	21	21	21	23	21	21	21	21	11:0	11
Twenty-third	8	8	8	8	8	8	8	8	8	8	8	8	....	0

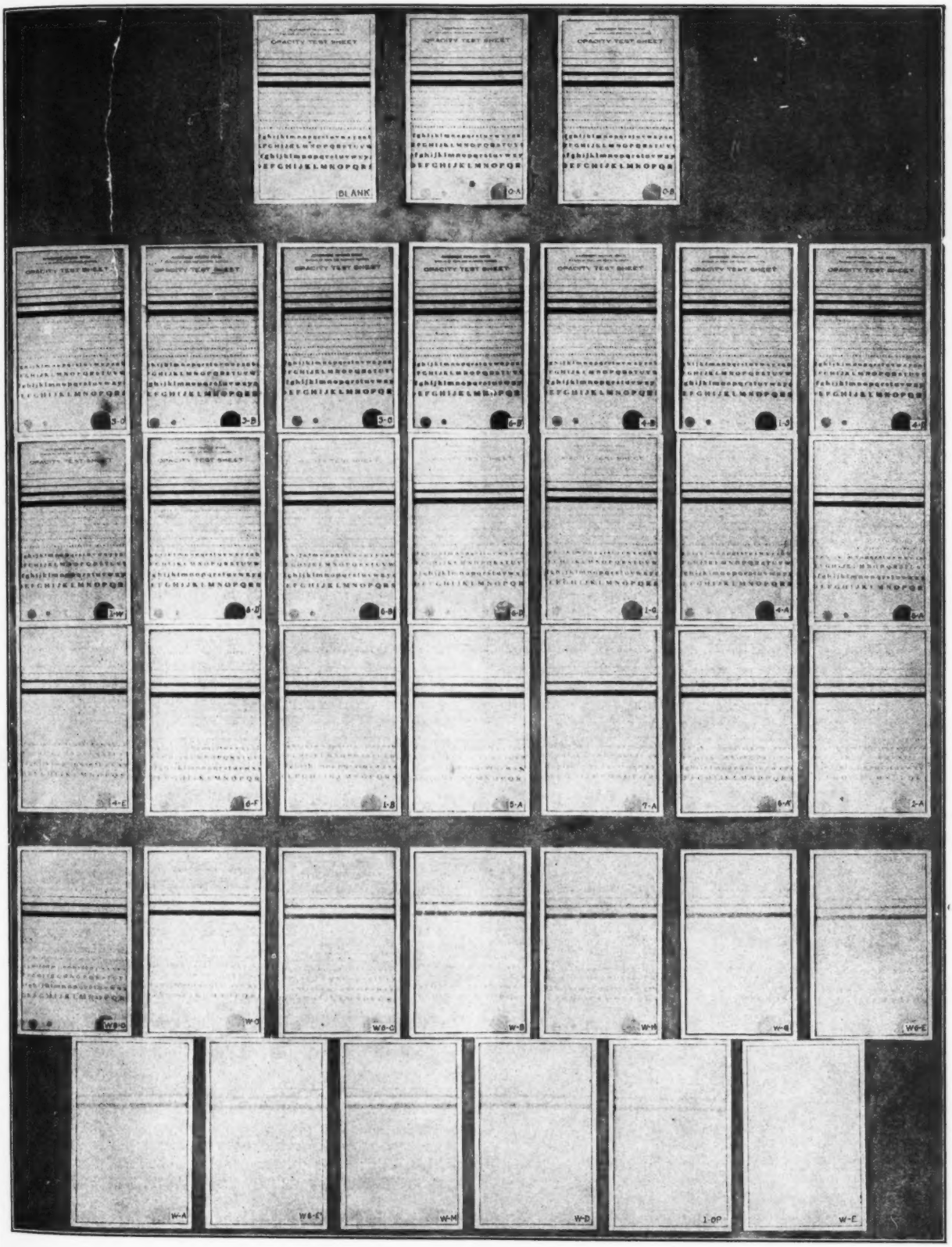

FIG. 1.
Photographic Series

In this case, where there was purposely no attempt to govern the conditions of observations, the discrepancies between various observers are more noticeable. Thus sample 13 was variously ranked from second to twelfth. It is impossible to determine with certainty, from the data available, the exact visual ranking of this sample. There are seven cases out of the twenty-three where the order of preference is based on 6:5 decisions and only three where all observers agreed. Out of 242 decisions only 185 or 76 per cent are in agreement.

The conclusion is drawn that visual ranking of transparency can be depended upon only where fairly large differences in this property are being observed.

Hence, certain widely different samples are selected as test cases and their optical properties examined in order to arrive at an analysis of the psychological reactions pertinent to transparency.

Spatial Distribution of Transmitted and Reflected Light

An optical set-up made for taking a series of measurements to determine the manner in which light is transmitted through the selected samples is illustrated in Fig. 2. The projector (P) gave a parallel beam (B) which impinged upon the sample () at 45 deg. incidence. The photocell (D) with a tube shield could be rotated around the samples so as to take readings at various angles for both transmission and reflection. The figure also presents graphically the data taken for a magnesium carbonate block. Each small arrow represents by its length the output of the photocell when in the position indicated by the direction of the arrow. Thus the length of the arrow is proportional to the light energy concentrated in a small cone with the line of the arrow as its axis. By drawing a smooth curve through the tips of the arrows a figure is obtained representing the light energy distribution above the surface which has a small finite area illuminated. Magnesium carbonate approaches the conditions of an ideal diffuse reflecting surface; the scattering of light is essentially isotropic and hence the light energy distribution curve is almost circular. There is, of course, no appreciable amount of light transmitted through the block.

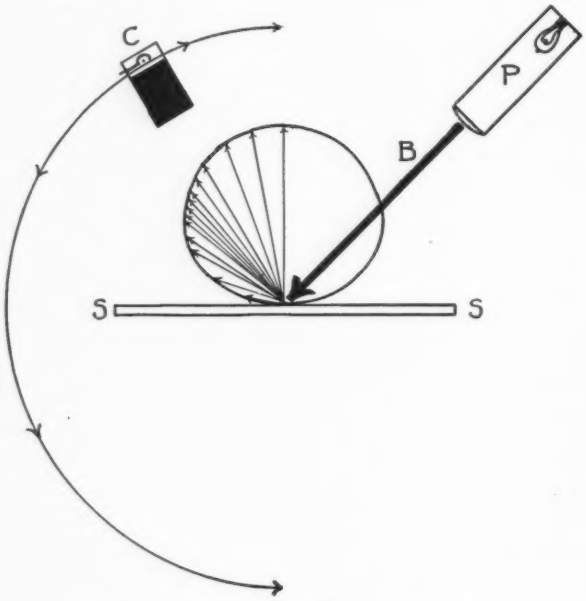

FIG. 2.
Magnesium Carbonate. (Scale, 1 cm. = 1 unit)

FIG. 3.
Cellophane D-A. (Scale 1 cm. = 20 units)

Fig. 3 represents a similar series of data taken for a sample of cellophane (O-A in the photographic series). In this case the values for the photocell output were of much larger magnitude than with magnesium carbonate and hence the scale for plotting is so selected that each unit represents twenty fold the output represented by the same unit in Fig. 2. It is to be observed that the light energies of both transmission and reflection are concentrated in narrow cones which are of approximately the same width as the angle subtended by the photocell. At angles of more than 10 deg. away from the lines of the original and the specularly reflected beams, the photocell readings are vanishingly small. In view of this it is obvious that the light beam has suffered very little scattering and has been transmitted as essentially parallel. Such transmission, where the emergent rays have suffered no appreciable change from the direction of the incident rays, will hereafter be termed "parallel transmission."

Fig. 4 represents the data taken for a sample of very transparent glassine (3-0), one of the best obtainable. The scale used in the upper portion is identical with that used for the magnesium carbonate data (Fig. 2), while that used for the lower portion is the same as that used for cellophane (Fig. 3). Particularly noticeamle in the upper portion of the graph are bulges in the light distribution curves as they approach the sample surfaces. For better illustration of this point, a portion of the cellophane distribution curve for reflected light is superimposed. This indicates that the light has been scattered by the paper sheet, and having been dissipated from the concentrated beam, the intensity in the latter has been markedly reduced. It must be remembered that a considerable amount of energy must be deviated from the concentrated pencil of light to give an appreciable reading of diffusely reflected or diffusely transmitted light. Certain fundamental differences in the properties of the diffusely transmitted and the parallel transmitted light may be pointed out. As the amount of incident light energy is constant, the scattered light is spread over a progressively larger area as the point of observation is removed from the sample. Thus the intensity of scat-

tered light per unit area varies inversely as the square of the distance, according to the classical law. The parallel transmitted light, on the other hand, remains concentrated in a small pencil and the intensity is essentially constant regardless of the distance of the point of observation from the sample. A similar comparison is to be made between diffusely and specularly reflected light.

The data for a glassine sample of medium transparency (6-D1) are shown in Fig. 5. A more pronounced scattering of the light and a further decrease in the intensity of the parallel transmitted light is to be observed. Fig 6 represents the data for a poorly transparent glassine (7-A). Along with further decrease in the intensity of the parallel transmitted beam, there is to be observed a very definite circular distribution of light energy at the base of the curve. This corresponds with the circular distribution observed with magnesium carbonate.

In Fig. 7 are presented the data for a sample of supercalendered waxing paper (not waxed) (W-6-C1). In the lower portion of the chart the distribution curves as plotted to the regular scale are so small that the tendency toward increased scattering is not obvious. Hence, it is shown both with the regular scale as used for cellophane data, and also with one which marks the size of the curves four times as large. The scattering may be seen as increasingly pronounced with continued decrease in intensity.

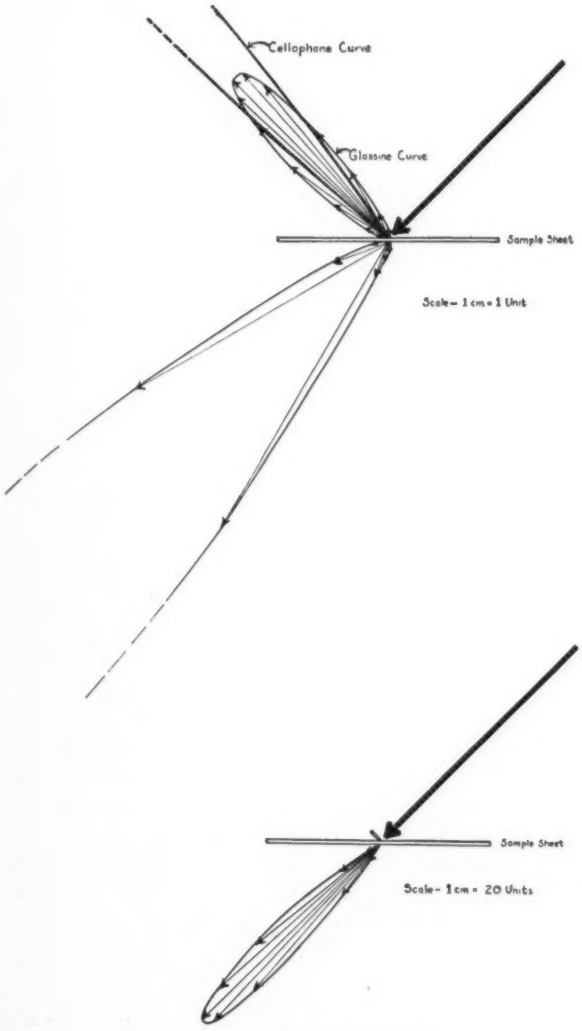

FIG. 4.
Glassine 3-O.

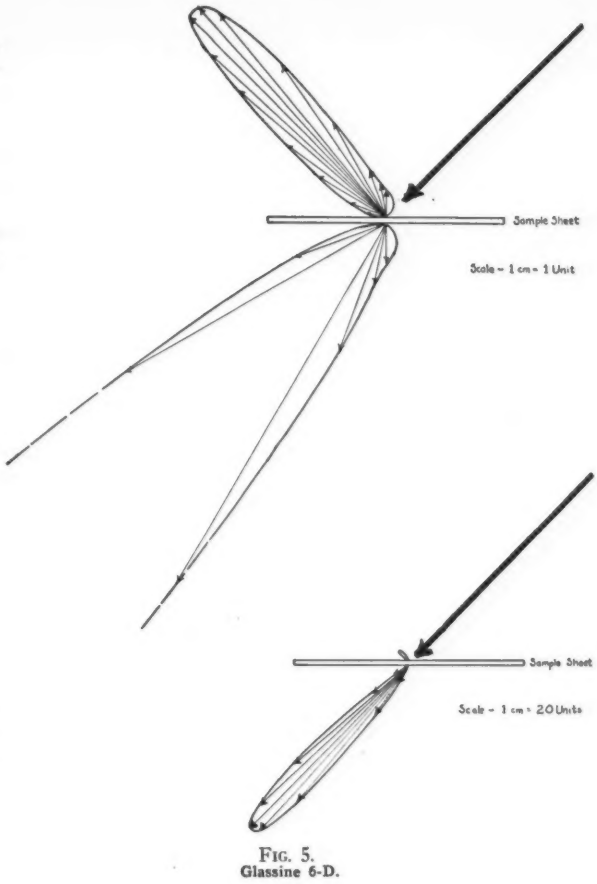

FIG. 5.
Glassine 6-D.

Fig. 8, which shows only the scale corresponding to magnesium carbonate data, gives the characteristics of a glassine paper which has not been supercalendered and which contains a certain amount of opacifying filler (1-OP not calendered; sample shown in Fig. 1 is same paper after supercalendering). There is to be observed a scattering of light which is almost isotropic and which closely resembles the conditions found with magnesium carbonate, except that there is a considerable amount of transmitted light. The photograph illustrates the fact, that, even when supercalendered, this paper has practically no transparency.

Thus in observing sheets which vary from excellent to poor transparency, there has been a progressive and consistent change in the distribution characteristics of the transmitted beam. Where transparency is pronounced, the beam remains concentrated and maintains high intensity, having undergone largely what we choose to call parallel transmission; where transparency is poor, the beam has been scattered to a large extent and has undergone to a large degree what we call diffuse transmission.

A practical measurement has been defined by arbitrarily selecting a certain small angle as the maximum change of direction to be considered as falling within the limits of parallel transmission and an instrument has been devised for observing the manner in which light

is distributed when impinging upon the samples in question under certain specified conditions. The results for the series are given in Table III.

TABLE III

Sample	Total Transmission	Parallel Transmission	Diffuse Transmission	Specular Reflection	Diffuse Reflection	Absorption
	Per cent of Light Energy of Incident Beam					
O-A, Cellophane	91.5	89.3	2.2	8.0	0.1	0.4
3-O, Glassine	86.9	37.5	49.4	6.3	4.5	2.2
6-D' Glassine	83.9	28.7	55.2	5.1	7.5	3.5
7-A Glassine	79.5	19.1	60.4	4.2	12.5	3.8
W-6-C' Waxing paper	70.7	13.7	57.0	2.7	21.6	5.1
1-OP, Unsupered Glassine	45.2	0.3	44.9	0.1	46.4	8.3

These data give confirmation of the conclusion that the distribution of light energy is the controlling factor in transparency, with high percentages of parallel transmitted light for the more transparent sheets as opposed to high percentages of diffuse transmitted light for the less transparent.

Visual Effects of Light Distribution

Now, with this background of the manner in which light is distributed on passing through a sheet, let us consider the visual effect produced. The upper portion of Fig. 9 represents a cross section of a sheet bearing alternate black and white lines, the black areas being relatively broad as compared to the white, with both widths large as compared to the thickness of the covering sheet. For simplification, the illumination is not illustrated and it is considered that the reflectance of the black is so low that, under normal conditions of illumination, the light is absorbed to a value below the minimum for producing stimulation of the eye, and hence we deal only with reflection from the white areas. Thus we are considering an ideal, imaginary black, as indicated in the diagram, as illustrated, light will be diffusely reflected from the white lines and the reaction of the eye is represented in qualitative manner by the Curve A. In scanning the sheet the eye observes clearly defined borders between white and black areas with vivid contrast in brightness between the same.

Curve B represents the reaction of the eye if the printed surface has a sheet of medium transparent paper but the contrast in brightness is less vivid as indicated by placed directly upon it. The definition remains sharp, but the contrast in brightness is less vivid as indicated by the decreased difference between the high and low points

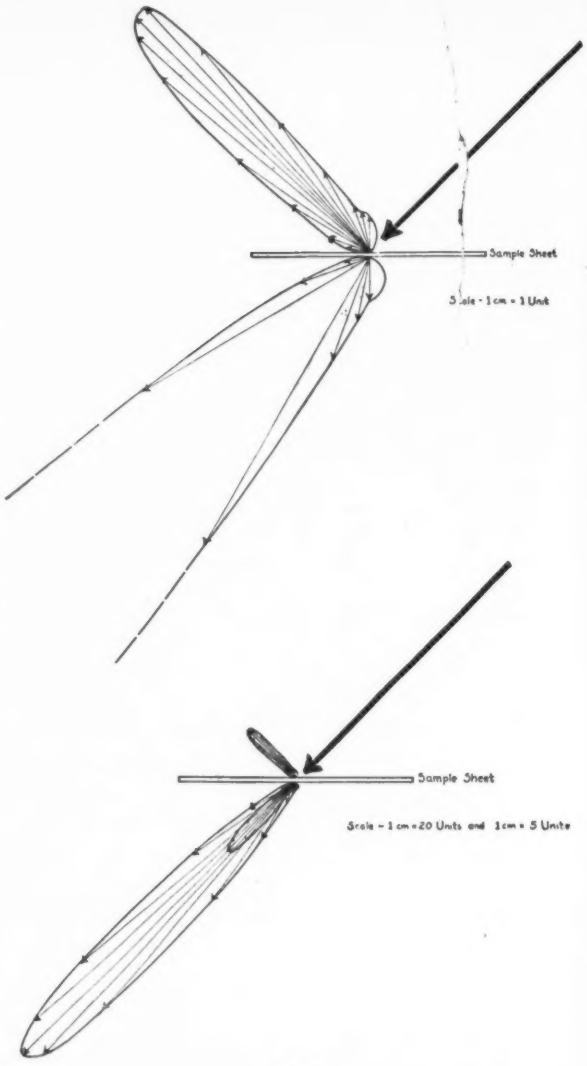

FIG. 7.
Waxing Paper W-6-C'

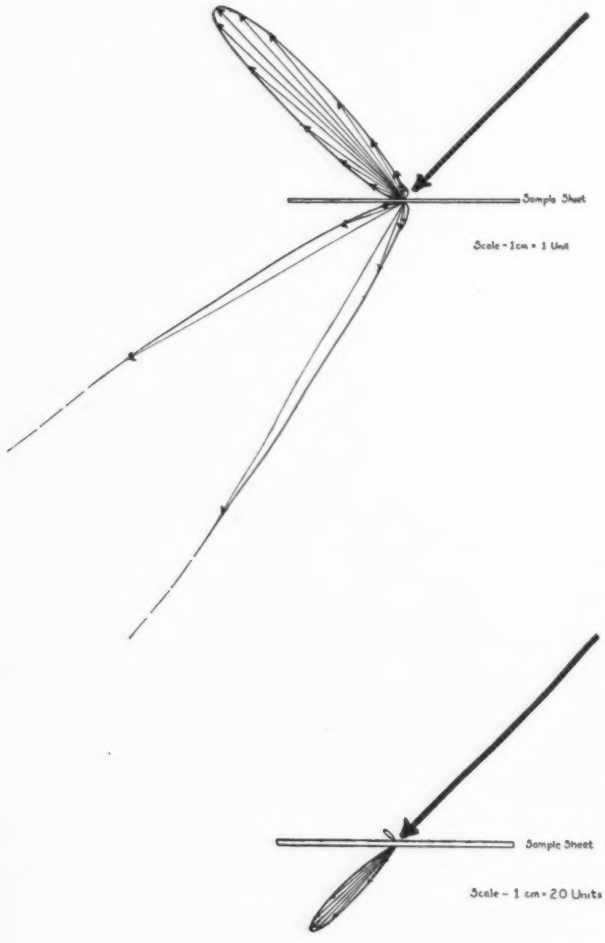

FIG. 6
Glassine 7-A.

of the curve. Very little change in the brightness for white areas is indicated, but the brightness for black areas has been increased. This is in accord with observations that black areas will assume a grayish appearance is assumed that neither the printed surface nor the transparent sheet is colored, and hence the white areas remain essentially unchanged in appearance.

Curve C represents the visual reaction when the surface is covered by a sheet which has some degree of opacity. In general the definition remains sharp, but the contrast is reduced to a very low difference, largely due to a white or gray appearance of the black areas.

Summarizing, when sheets are laid directly over a printed surface, the contrasts between various portions of the surface are reduced as a function of the degree of opacity of the sheet, but the sharpness of definition of the image is not materially affected except by papers of non-uniform opacity, *i.e.*, mottled.

Figure 10 represents the conditions when the transparent sheet is held at a slight distance from the printed surface. Again the light of illumination is not illustrated. Light diffusely reflected from the white area strikes the sheet at portions which are over black areas and, being diffused by the sheet, is partly directed toward

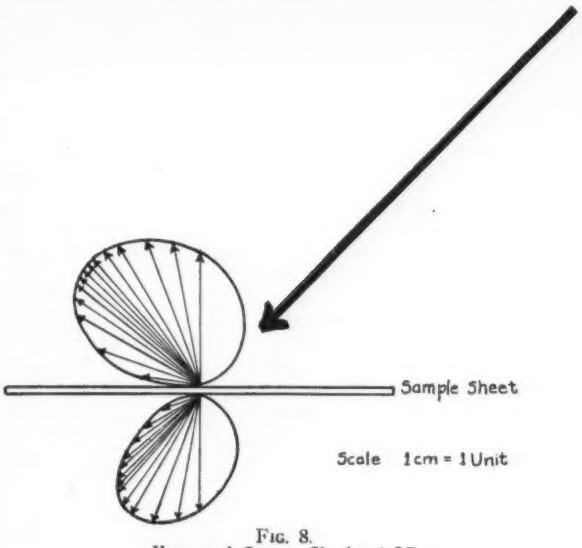

FIG. 8.
Unsupened Opaque Glassine 1-OP.

the eye. Thus the eye, receiving a light stimulus from the direction of the black area, sees the interposed sheet as a white screen. As the intensity of the light diffusely reflected from the printed surface varies with the angle of reflection, this whitish appearance is most noticeable

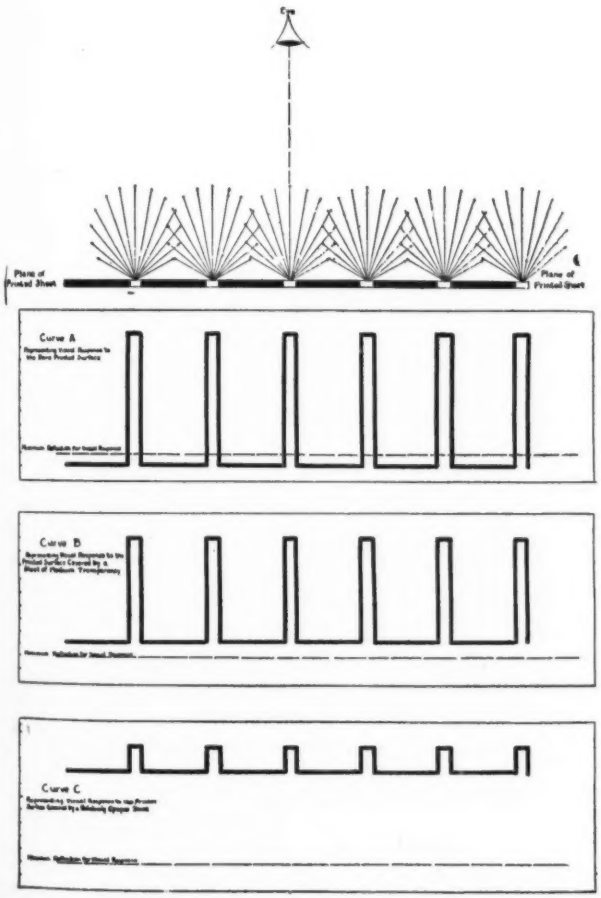

FIG. 9.
Curve A—Representing Visual Response to the Bare Printed Surface. Curve B—Representing Visual Response to the Printed Surface Covered by a Sheet of Medium Transparency. Curve C—Representing Visual Response to the Printed Surface Covered by a eRlatively Opaque Sheet.

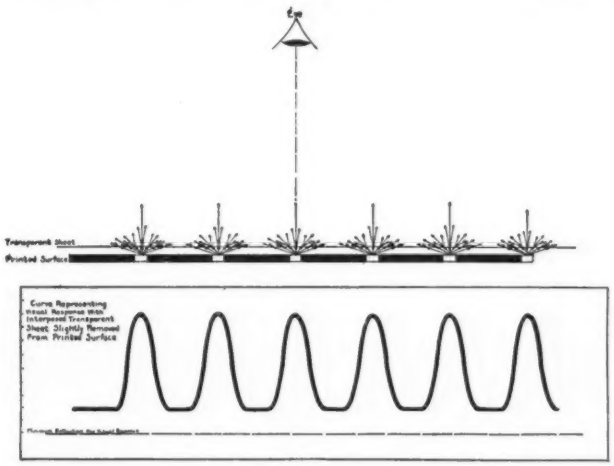

FIG. 10.
Curve Representing Visual Response with Interposed Transparent Sheet Slightly Removed From Printed Surface.

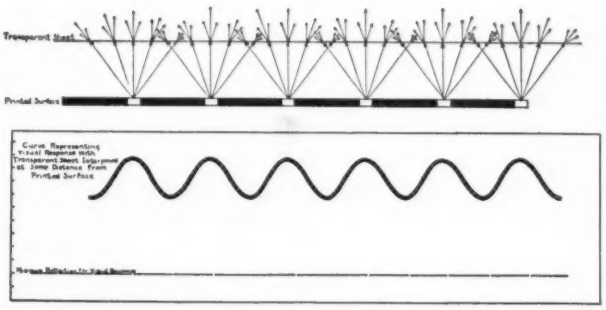

FIG. 10-A.
Curve Representing Visual Response With Transparent Sheet Interposed at Some Distance from Printed Surface.

near the white areas and reaches a minimum at the center of the black area. Thus the visual effect of transition from white to black areas is not sharp, but gradually merges from one to the other type with blurring at the borders. At the same time the vividness of the contrast is impaired. These effects are represented qualitatively by the curve.

Fig. 10-a represents the conditions when the sheet is held at a greater distance from the surface. In this case, the effect of diffusely reflected light striking the transparent sheet over black areas is even more pronounced and the blurring of the image is much more striking. This is due to the fact that the light reflected from the white areas is more uniformly distributed over the transparent sheet surface, which not only contributes to the reduction of the sharpness of resolution, but also to the reduction in contrast between the white and black areas. Thus the transparency, as observed visually, varies with the distance between the sheet and the object being viewed, if the former has a tendency to scatter light. Such is not the case for a non-scattering sheet, where essentially all transmission is parallel; under such conditions the ability to see through the sample is independent of distance, within the range of vision.

Transparency Versus Opacity

An ideal condition of transparency is one in which there is no reflection, refraction, or absorption of light; a perfect vacuum represents this condition. An ideal condition of opacity is one in which a body is absolutely impervious to the passage of rays of light. Between these strictly ideal extremes lies a rather indefinite range of conditions termed as those of translucency. The latter term is defined as "the property of transmitting rays of light so that bodies can not be distinctly seen through." There is no sharp line of demarcation between the properties defined by these three terms, and papers or cellulosic films can be made to fall at almost any point between the extremes. The majority of papers vary from translucent to opaque, while glassines, waxings, cellulosic films, etc., vary from translucent to transparent.

It must be emphasized that, when considered as practical use requirements of paper, opacity and transparency are related, but are distinctly different concepts. It is erroneous to consider them as the opposite extremes of the same property. In considering opacity as a property which is not absolute, but is capable of variance in degree, the paper technologist conceives of it as the degree of imperviousness to rays of light expressed in terms which indicate the hiding power of a sheet when placed directly over a surface being viewed.

In many laboratories the practice is properly established of measuring degree of opacity of paper in terms of visual contrast of value, *i. e.*, darkness and brightness under conditions which are most favorable for permitting a sheet to be seen through, *i. e.*, by a comparison of measurements of reflection of a sheet directly over black with those of the sheet directly over white. Where imperviousness to light rays is the desired quality, obviously the more rigorous test conditions as obtained by placing the sheet directly over a white surface or a black box are to be preferred. Opacity as so conceived and so measured has nothing whatever to do with sharpness of resolution of the image.

On the other hand, the paper technologist must consider degree of transparency as the degree to which rays of light are transmitted so that sheets may be distinctly seen through. In this case one must consider not only the reduction in contrast caused by the sheet, but of primary importance is the sharpness of resolution of the image received from the light rays which are transmitted. In other words, opacity has to do with reflection and the passage of light through the sheet, and whether it emerges as diffused or non-diffused rays is of no consequence; transparency, on the other hand, is absolutely dependent upon the property of the sheet for transmitting rays of light without scattering.

Another method for measuring opacity which is well established in the industry is that of observing the percentage of incident light energy which passes through a sheet under certain specified conditions. Neither this nor the contrast ratio are generally sound measurements of transparency, due to the fact that they make no differentiation between scattered and non-scattered light rays. The contrast method may be applied to transparency only in the limited case where the transparent sheet is placed directly upon the surface under observation, and hence clear resolution is obtained regardless of scattering characteristics.

Contrast Visibility

Consider a transparent or semi-transparent sheet covering a black and white printed surface, such as that illustrated in Fig. 9. The illumination must, of course, strike the transparent sheet, be transmitted to the surface and, if reflected, pass back through the sheet. The eye will observe over ideal black areas a brightness which corresponds only to the reflectivity of the transparent sheet; over white areas the brightness will be a function of the combined effect of the transmission and reflection characteristics of the transparent sheet and the reflection characteristics of the white surface. Fechner's rule observes that the vividness of the visual reaction of brightness is proportional to the logarithm of the energy of the stimulus. That is:

$$\log I - \log I_o = K(S - S_o), \qquad (1)$$

where I = Energy of stimulus,
I_o = Minimum energy value for stimulation,
S = Intensity of visual sensation,
S_o = Threshold value of visual sensation,
and K = Proportionality constant.

Hence if a black and white surface is covered by a semi-transparent sheet,

$$\text{sensation of white areas} = \frac{1}{K}\left[\log \begin{pmatrix}\text{reflection of sheet}\\ \text{over white}\end{pmatrix} - \log I_o\right], \qquad (2)$$

$$\text{and sensation of black areas} = \frac{1}{K}\left[\log \begin{pmatrix}\text{reflection of sheet}\\ \text{over black}\end{pmatrix} - \log I_o\right], \qquad (3)$$

The difference in the two sensations, or the contrast is therefore:

$$\text{Contrast} = \frac{1}{K}\left[\log \begin{pmatrix}\text{reflection of sheet}\\ \text{over white}\end{pmatrix} - \log \begin{pmatrix}\text{reflection}\\ \text{of sheet over black}\end{pmatrix}\right]. \qquad (4)$$

$$K \times \text{Contrast} = \log\left[\frac{(\text{reflection of sheet over white})}{(\text{reflection of sheet over black})}\right]. \qquad (5)$$

$$\frac{1}{\text{Anti-log } (K \times \text{Contrast})} = \frac{(\text{reflection of sheet over black})}{(\text{reflection of sheet over white})}. \qquad (6)$$

This last term is the well-known contrast ratio. No issue is raised with its employment, as the use of a ratio is fundamentally sound. The matter of interpretation in arithmetical or logarithmic terms, or as a direct or inverse ratio, is one of personal choice. Our choice with respect to interpretation of transparency measurements for the limited conditions mentioned above, is as follows:

$$\text{Contrast with sheet interposed} = \frac{1}{K} \times \log\left[\frac{\text{(reflection of sheet over white)}}{\text{(reflection of sheet over black)}}\right] \quad (7)$$

$$\text{Contrast without sheet interposed} = \frac{1}{K} \times \log\left[\frac{\text{(reflection of white surface)}}{\text{(reflection of black surface)}}\right]. \quad (8)$$

$$\text{Per cent contrast visibility} = 100 \times \left[\frac{\text{(contrast with sheet interposed}}{\text{(contrast without sheet interposed)}}\right] \quad (9)$$

$$= 100 \times \frac{\log\left[\frac{\text{(reflection of sheet over white)}}{\text{(reflection of sheet over black)}}\right]}{\log\left[\frac{\text{(reflection of white surface)}}{\text{(reflection of black surface)}}\right]}. \quad (10)$$

Equation (10), being based on Fechner's rule, applies only for the range of light intensities where this rule applies; the validity of the contrast ratio as an indication of visual sensation is similarly limited.

By defining certain measurable optical properties of a sheet, an equation may be set up for per cent contrast visibility which will illustrate how these various properties affect it.

Assuming illumination with a parallel light beam, let:

R_{ds} = Diffuse reflectance of the transparent sheet
R_{ts} = Total reflectance of the transparent sheet
R_w = Reflectance of the white surface.
R_b = Reflectance of the black surface.
T = Transmittance of the sheet.
K = Ratio of transmittance of parallel light to transmittance of diffuse light.
I_o = Energy of incident illumination.
X = Fraction of total emergent energy which is received at point of observation.

The reflection of the sheet over white is the sum of several values, namely:

(1) The diffuse reflection of the sheet itself (the eye is assumed as not in the line of the specular beam).
(2) Light transmitted through the sheet, reflected from the white surface and transmitted again toward the eye.
(3) Light which is subjected to mutiple reflections between the white surface and the sheet, a portion being transmitted toward the eye with each reflection.

These values may be expressed as follows:

$$\text{Reflection over white} = I_o K T^2 R_w \left[\frac{1}{1 - R_w R_{ts}}\right] x + I_o R_{ds} x. \quad (11)$$

In a similar manner:

$$\text{Reflection over black} = I_o K T^2 R_b \left[\frac{1}{1 - R_b R_{ts}}\right] x + I_o R_{ds} x. \quad (12)$$

$$\text{Reflection of white surface} = I_o R_w x \quad (13)$$

$$\text{Reflection of black surface} = I_o R_b x \quad (14)$$

By substitution of these values, equation (10) becomes:

$$\text{Per cent Contrast Visibility} = 100 \times \frac{\log\left[\dfrac{I_o K^2 R_w \left\{\dfrac{1}{1-R_w R_{ts}}\right\} x + I_o R_{ds} x}{I_o K T^2 R_b \left\{\dfrac{1}{1-R_w R_{ts}}\right\} x + I_o R_{ds} x}\right]}{\log \dfrac{I_o R_w x}{I_o R_b x}} \quad (15)$$

$$= 100 \times \frac{\log\left[\dfrac{K T^2 R_w \left\{\dfrac{1}{1-R_w R_{ts}}\right\} + R_{ds}}{K T^2 R_b \left\{\dfrac{1}{1-R_b R_{ts}}\right\} + R_{ds}}\right]}{\log \dfrac{R_w}{R_b}} \quad (16)$$

Equation (16) is a general expression which assumes different forms for various conditions where certain terms approach negligible values. The most rigorous application for transparency evaluation will be the observation of reduced contrasts, such as those between whites and grays or near-blacks in a halftone engraving. In the case of a cellophane sheet covering such a printed surface, R_{ds} approaches a negligible value and R_{ts} approaches a constant value determined by the specular reflectance of the sheet. Thus, equation (16) approaches:

$$\text{Per cent contrast visibility} = 100 \times \frac{\log\left[\dfrac{K T^2 R_w \left\{\dfrac{1}{1-R_w R_{ts}}\right\}}{K T^2 R_b \left\{\dfrac{1}{1-R_b R_{ts}}\right\}}\right]}{\log \dfrac{R_w}{R_b}}$$

$$= 100 \times \frac{\log\left[\dfrac{R_w(1-R_b R_{ts})}{R_b(1-R_w R_{ts})}\right]}{\log \dfrac{R_w}{R_b}}$$

= A constant slightly in excess of 100.

That is to say, as R_{ds} approaches a negligible value the contrast visibility approaches asymptotically a limiting value which is actually in slight excess of the contrast of the bare printed surface. This interesting phenomenon may be seen by careful observation of a halftone printing partially covered by a cellophane sheet. The contrast will be found slightly more vivid in the portion covered by cellophane when viewed in a manner so that specular reflection does not strike the eye. This results from the fact that the brightness of gray areas suffers greater proportional decrease than that of white areas.

An important corollary of these relationships is that contrast visibility for light transmitting sheets of negligible diffuse reflectance is independent, within the limits of Fechner's rule, of such light absorption as might be caused by the presence of dye. It is seen from the Photographic Series (Fig. 1) that samples 3-B, 3-C, 6-B, 1-S, 4-D, 1-W, and 6-D[1], although quite dark and hence relatively light absorbent, show vivid contrasts. It is also seen that the light gray spot at the bottom of the test sheet actually shows more contrast for those glassines and for cellophanes O-A and O-B than does the same spot in the "Blank" photograph.

The most rigorous application of Equation (17) for translucency and opacity will be the observation of vivid contrast, such as that between a white sheet and printer's ink. Under these conditions R_b becomes negligible and R_{ds} is rather high. Equation (17) then becomes:

$$\text{Per cent contrast visibility} = \frac{100}{\log \dfrac{R_w}{R_b}} \times \log\left[\frac{K T^2 R_w \left\{\dfrac{1}{1-R_w R_{ts}}\right\} + R_{ds}}{R_{ds}}\right]$$

If the sheet is not colored, and hence does not absorb an appreciable amount of light, the brightness over white, due to compensating effects, remains essentially constant and the diffuse reflectance of a single sheet, which controls the brightness over black, also controls the contrast

visibility to a large degree. On the other hand, if dye is present, the brightness over white is affected as a function of the first power of $R_{d\infty}$ and the square of T, while the brightness over black is affected only as the first power of $R_{d\infty}$; hence the contrast visibility will not be independent of, but will be decreased by the absorptive properties of the sheet. As T^2 approaches a negligible value, the contrast visibility approaches:

$$\frac{100}{\log \frac{R_w}{R_b}} \times \log \left[\frac{R_{d\infty}}{R_{d\infty}} \right] = 0.$$

Light Scattering and Transparency

Thus as sheets become increasingly opaque, contrast visibility approaches asymptotically a limiting value of zero. Here again the absorptive properties of the sheet have no effect.

In the foregoing discussion of the limited condition of transparency evaluation, where the transparent sheet is placed in direct contact with a printed surface, the considerations have been limited to the changes in contrast due to transmittance and reflectance properties. When we consider the more rigorous and more general conditions of transparency, that is, those in which the object under view is removed some distance from the sheet, clear and distinct resolution of the image becomes of primary importance. Thus, the tendency toward scattering of light by the sheet assumes major importance. Under these conditions clear resolution of the image is determined by light scattering characteristics alone. As pointed out in the discussion accompanying Fig. 10, these characteristics also determine the extent of reduction in contrast resulting from diffusion of light reflected from the surface or object under view, and causing the sheet to appear as a white screen. Therefore, the tendency to direct the paths of rays of light becomes the dominant property in determining transparency in so far as clear resolution and reduction in contrast are concerned.

However, we have yet to consider the effect of light absorption. We have seen that sheets which have negligible diffuse reflectance have contrast visibilities which are independent of light absorption within the limits of Fechner's rule. Light absorption has no effect upon sharp resolution, nor does it contribute to the white screen appearance of the interposed sheet. For transparent sheets, the effect of absorption is merely to reduce the light energy level of the entire system, a condition to which the eye may adjust itself within the limits of applicability of Fechner's rule.

To illustrate this point, it may be pointed out that a gelatine light filter may absorb 50 per cent or more of incident light, and yet, under proper conditions of illumination, give the sensation of excellent transparency; or again, dark glasses in no way impair the motorist's vision in bright sunlight. They are transparent, although highly light absorbent.

If not uniform for all portions of the spectrum, light absorption will affect reception of the sensation of hue and will change the contrast relationships when viewing objects of various colors. All of the foregoing discussion has been with consideration of achromatic conditions. This is because glassine papers for the most part are either colorless or only slightly tinted, thus minimizing chromatic effects. If strong chromatic effects are to be considered, all pertinent properties must be defined for definite wave lengths of light; results must be interpreted for each set of conditions of observation as an integrated effect of the individual components of the visible band and the spectral response of the eye to each wave length. As the problem at hand is not considered as demanding these complications, we limit ourselves to achromatic conditions and define our properties in terms of light energy units to which there is equal visual response.

Our conclusion is that the light-scattering characteristic of a sheet is the single property which is most closely related to transparency as observed visually; that, within the limits of Fechner's rule, this property is truly indicative of the property of transmitting rays of light so that bodies may be distinctly seen through.

A relatively simple measurement of this property may be made by observing parallel and total transmittance values and expressing the former as a percentage of the latter. This percentage is termed the Transparency Ratio; the difference between the transparency ratio and 100 is called the Diffuse Transmission Ratio.

Following herewith is given a tabulation of these values for the samples included in Table III.

	Transparency Ratio	Diffuse Transmission Ratio	100 × Contrast Ratio
0-A	97.6	2.4	7.9
3-O	43.1	56.9	12.0
6-D	34.2	65.8	15.0
7-A	24.0	76.0	20.0
W-6-C'	19.4	80.6	30.0
1-OP (not calendered)	0.7	99.3	59.0

No attempt is made to set up a complicated mathematical expression for interpreting transparency ratio in terms of visual reaction. In a later section covering instrumental studies of glassines, it will be shown why such is considered unnecessary.

Exports of Canadian Pulp Increase

WASHINGTON, D. C., October 20, 1937. — Exports of all classes of wood pulp from Canada during the first eight months of the current year were substantially higher than during the corresponding period of 1936, according to the Forestry Products Division, Department of Commerce, based upon a special report of the Canadian Pulp and Paper Association.

Exports of bleached sulphite, which represented the largest item in this group, rose from 226,522 short tons to 255,728 short tons. During the same period exports of unbleached sulphite pulp amounted to 111,558 tons compared with 74,485 tons exported during the corresponding period of last year; exports of sulphite pulp amount to 85,710 tons compared with 77,537 tons last year, and mechanical pulp rose from 88,527 tons to 98,345 tons.

During the first eight months, the United States was the largest supplier of Canadian wood pulp of all classes, with the exception of unbleached sulphite, having taken 80 per cent of the bleached sulphite, 96 per cent of the sulphate, and practically all of the mechanical pulp. On the other hand, United States' imports of unbleached sulphite dropped from 52,234 tons during the first eight months of last year, which was 70 per cent of the total, to only 1,644 tons, or one per cent, during the corresponding period of last year.

Exports of unbleached sulphite to Japan rose from 18,853 tons last year, to 79,161 tons during the current year, and exports of this item to the United Kingdom rose from only 869 tons to 28,559 short tons during the same period, according to the report.

Germany Increases Paper Production

Paper production in Germany during the first 3 months of this year reached a total of 656,900 metric tons, according to statistics recently published. This year's production represents an increase of 46,900 metric tons over the corresponding period in 1936.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS
WEEK ENDING OCTOBER 16, 1937

SUMMARY

Cigarette paper .....454 cs.
Wall paper .....3 cs.
Paper hangings .....15 bls., 1 cs.
Newsprint .....15 bls., 5,061 rolls
Printing paper .....142 rolls, 40 bls., 355 cs.
Wrapping paper .....2,598 rolls, 98 bls., 18 cs.
Packing paper .....5 cs.
Drawing paper .....8 cs.
Filter paper .....89 bls., 7 cs.
Surface coated paper .....146 crates, 62 cs.
Photo paper .....8 cs.
Basic paper .....24 cs.
Decalcomania paper .....27 drums, 11 cs. (duplex)
Transfer paper .....3 cs.
Colored paper .....1 cs.
Gummed paper .....9 cs.
Writing paper .....32 cs.
Straw paper .....11 bls.
Paper tubes .....69 pkgs.
Miscellaneous paper .....4 bls., 71 cs.

CIGARETTE PAPER

R. J. Reynolds Tob. Co., *American Traveler,* Havre, 95 cs.
American Tobacco Co., *Collamer,* Bordeaux, 242 cs.
Champagne Paper Corp., *Collamer,* Bordeaux, 117 cs.

WALL PAPER

A. W. Fenton Co. Inc., *Britannic,* London, 1 cs.
———, *Europa,* Bremen, 2 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *Britannic,* London, 15 bls., 1 cs.

NEWSPRINT

International Paper Co., *International No. 1,* Gatineau, 306 rolls.
International Paper Co., *G.T.D.,* Gatineau, 317 rolls.
H. G. Craig Co. Inc., *A.C.D.,* Donnacona, 436 rolls.
Jay Madden Corp., *Berlin,* Bremen, 434 rolls.
Jay Madden Corp., *American Traveler,* Hamburg, 154 rolls.
N. Y. Eve. Journal, *American Traveler,* Hamburg, 335 rolls.
Perkins Goodwin & Co., *American Traveler,* Hamburg, 368 rolls.
H. G. Craig Co. Inc., *Donpaco,* Donnacona, 367 rolls.
Wilkinson Bros. & Co. Inc., *Scanyork,* Kotka, 98 rolls.
Lunham & Reeve, Inc., *Scanyork,* Kotka, 434 rolls, 15 bls.
Jay Madden Corp., *Scanyork,* Kotka, 38 rolls.
Walker Goulard Plehn Co. Inc., *Scanyork,* Kotka, 134 bls.
Jay Madden Corp., *Washington,* Hamburg, 288 rolls.
Jay Madden Corp., *Hansa,* Hamburg, 450 rolls.
Perkins Goodwin & Co., *Hansa,* Hamburg, 105 rolls.
N. Y. Post, *Hector,* Port Alfred, Que., 797 rolls.

PRINTING PAPER

L. A. Consmiller, *Berlin,* Bremen, 21 cs.
Dingelstedt & Co., *Berlin,* Bremen, 140 cs.
Jay Madden Corp., *American Traveler,* Hamburg, 73 rolls, 40 bls.
F. C. Strype, *Veendam,* Rotterdam, 86 cs., 24 rolls.
The Macmillan Co., *Aquitania,* Southampton, 1 cs.
Dingelstedt & Co., *Hansa,* Hamburg, 45 rolls, 51 cs.
E. Dietzgen & Co., *Hansa,* Hamburg, 56 cs.

WRAPPING PAPER

Equitable Paper Bag Co., *American Traveler,* Hamburg, 1,112 rolls, 7 bls.
Jay Madden Corp., *American Traveler,* Hamburg, 954 rolls.
M. M. Cohen, *American Traveler,* Hamburg, 195 rolls, 35 lbs.
M. M. Cohen, *Washington,* Hamburg, 337 rolls, 56 bls.
Keller Dorian Paper Co., *Excalibur,* Marseilles, 8 cs.
Steiner Paper Corp., *Hansa,* Hamburg, 7 cs.
Phoenix Shipping Co., *Hansa,* Hamburg, 3 cs.

PACKING PAPER

Phoenix Shipping Co., *Berlin,* Bremen, 5 cs.

DRAWING PAPER

H. Reeve Angel & Co. Inc., *Britannic,* London, 3 cs.
D. C. Andrews & Co., *Europa,* Bremen, 5 cs.

FILTER PAPER

H. Reeve Angel & Co. Inc., *Britannic,* London, 7 cs.
J. Manheimer, *Aquitania,* Southampton, 89 bls.

SURFACE COATED PAPER

Gevaert Co. of America, *Black Gull,* Antwerp, 31 cs.
Gevaert Co. of America, *Westernland,* Antwerp, 26 cs.
L. A. Consmiller, *Europa,* Bremen, 1 cs.
Globe Shipping Co., *Hansa,* Hamburg, 146 crates.
C. Happel, *Hansa,* Hamburg, 4 cs.

PHOTO PAPER

J. J. Gavin, *Aquitania,* Southampton, 8 cs.

BASIC PAPER

———, Berlin, *Bremen,* 13 cs.
Dingelstedt & Co., *Hansa,* Hamburg, 11 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Franconia,* Liverpool, 27 drums, 11 cs. (duplex).

TRANSFER PAPER

Phoenix Shipping Co., *Hansa,* Hamburg, 3 cs.

COLORED PAPER

———, Hansa, Hamburg, 1 cs.

GUMMED PAPER

Heemsoth Kerner Corp., *Europa,* Bremen, 9 cs.

WRITING PAPER

———, *American Traveler,* Havre, 2 cs.
Globe Shipping Co., *Washington,* Hamburg, 30 cs.

STRAW PAPER

American Express Co., *Hansa,* Hamburg, 11 bls.

PAPER TUBES

———, *Berlin,* Bremen, 69 pkgs.

MISCELLANEOUS PAPER

Japan Paper Co., *Britannic,* London, 1 cs.
———, *Britannic,* London, 4 bls., 3 cs.
Japan Paper Co., *Anna Maersk,* Kobe, 67 cs.

RAGS, BAGGINGS, ETC.

Castle & Overton, Inc., *City of Bagdad,* Hamburg, 704 bls. bagging.
Irving Trust Co., *Black Gull,* Antwerp, 48 bls. rags.
Van Oppen & Co., *Berlin,* Bremen, 40 bls. rags.
National City Bank, *Nankai Maru,* Kobe, 36 bls. flax waste.
Hughes Fawcett, Inc., *Caledonia,* Glasgow, 42 bls. flax waste.
Philadelphia National Bank, *Westernland,* Antwerp, 133 bls. rags.
W. Steck & Co., *Express,* Piraeus, 130 bls. bagging.
E. J. Keller Co., Inc., *Express,* ———, 294 bls. rags.
———, *Express,* Thessalonika, 64 bls. bagging.
National City Bank, *American Traveler,* Hamburg, 17 bls. rags.
Chase National Bank, *American Traveler,* Havre, 73 bls. rags.
———, *American Traveler,* Havre, 41 bls. rags.
Irving Trust Co., *American Traveler,* Havre, 148 bls. rags.
———, *Kosei Maru,* Kobe, 330 bls. cotton waste.
D. S. Stern Corp., *Kosei Maru,* Kobe, 100 bls. cotton waste.
Hicks Costarino Co. Inc., *Kosei Maru,* Kobe, 50 bls. rayon waste.
Royal Manufacturing Co., *Kosei Maru,* Kobe, 15 bls. rags.
———, *Ingria,* Casablanca, 410 bls. rags.
Banco Coml. Italiane Trust Co., *Exmoor,* Sfax, 485 bls. rags.
R. Blank, *Collamer,* Havre, 139 bls. rags.
E. J. Keller Co. Inc., *Collamer,* ———, 44 bls. rags.
Darmstadt Scott & Courtney, *Collamer,* Bordeaux, 186 bls. rags.

Irving Trust Co., *Collamer*, Bordeaux, 46 bls. rags.
E. J. Keller Co. Inc., *Excalibur*, ——, 300 bls. paper stock, 130 bls. bagging.
W. Steck & Co., *Excalibur*, Alexandria, 22 bls. bagging.
Keene, Inc., *Excalibur*, Alexandria, 135 bls. rags.
R. Blank, *Excalibur*, Alexandria, 68 bls. rags.
Burka Bagging Co., *Fort Amherst*, Halifax, 106 bls. bagging.
S. Shapiro & Son, *Anna Maersk*, Kobe, 46 bls. thread waste.
E. J. Keller Co. Inc., *Anna Maersk*, ——, 82 bls. paper stock.

HIDE CUTTINGS

H. Remis & Co., *Siboney*, Havana, 55 bags.

OLD ROPE

W. Steck & Co., *Veendam*, Rotterdam, 48 coils.
Chase National Bank, *Toronto City*, Bristol, 247 coils.
——, *Toronto City*, Bristol, 57 coils.
Banco Coml. Italiane Trust Co., *Elin K.*, London, 73 coils.
E. J. Keller Co. Inc., *Statendam*, ——, 66 coils.

ROPE WASTE

Darmstadt Scott & Courtney, *Kosei Maru*, Kobe, 80 bls.
Chase National Bank, *Kosei Maru*, Kobe, 80 bls.
Loumar Textile By Products, *Anna Maersk*, Kobe, 100 bls.

WOOD PULP

Johaneson Wales & Sparre, Inc., *Berlin*, Bremen, 1,016 bls. chemical pulp.
Absorbo Beer Pad Co., *American Traveler*, Hamburg, 200 bls. wood pulp.
Price & Pierce, Ltd., *Gypsum Prince*, Windsor, N. S., 480 bls. wood pulp.
Johaneson Wales & Sparre, Inc., *Karpfanger*, Obbola, 3,395 bls. sulphate, 485 tons.
Johaneson Wales & Sparre, Inc., *Karpfanger*, Sundsvall, 2,925 bls. sulphite, 600 tons.
Johaneson Wales & Sparre, Inc., *Karpfanger*, Sundsvall, 200 bls. chemical pulp, 40 tons.
Johaneson Wales & Sparre, Inc., *Karpfanger*, Sundsvall, 120 lbs. knotter pulp, 20 tons.
Johaneson Wales & Sparre, Inc., *Karpfanger*, Sundsvall, 150 bls. sulphate, 25 tons.
Mead Sales Co. Inc., *Karpfanger*, Sundsvall, 210 bls. chemical pulp, 42 tons.
Mead Sales Co. Inc., *Karpfanger*, Sundsvall, 310 bls. sulphite, 62 tons.
Bulkley Dunton Pulp Co. Inc., *Karpfanger*, ——, 2,750 bls. sulphite, 475 tons.
Bulkley Dunton Pulp Co. Inc., *Karpfanger*, ——, 3,000 bls. chemical pulp, 600 tons.
Johaneson Wales & Sparre, Inc., *Karpfanger*, Munksund, 400 bls. sulphate, 50 tons.
Brown Bros. Harriman & Co., *Karpfanger*, Stugsund, 450 bls. sulphite, 90 tons.
——, *Karpfanger*, Stugsund, 3,125 bls. sulphite, 625 tons.
Lagerloef Trading Co., *Scanyork*, Wiborg, 1,270 bls. mechanical pulp, 254 tons.
Lagerloef Trading Co., *Scanyork*, Wiborg, 4,175 bls. sulphite, 820 tons.
Guaranty Trust Co., *Birmania*, Trieste, 933 bls. sulphite.
M. Sone, *Birmania*, Trieste, 1,395 bls. wood pulp.
——, *Hansa*, Hamburg, 2,680 bls. wood pulp, 536 tons.
Castle & Overton, Inc., *Hansa*, Hamburg, 1,750 bls. wood pulp, 350 tons.
Bank of N. Y. Trust Co., *Hansa*, Hamburg, 555 bls. wood pulp, 111 tons.

WOOD PULP BOARDS

Jay Madden Corp., *Scanyork*, Wiborg, 20 bls.
Jay Madden Corp., *Scanyork*, Kotka, 535 rolls.
Flexideal Dry Mat Co., *Washington*, Hamburg, 125 cs.

NEWARK IMPORTS

WEEK ENDING OCTOBER 16, 1937

H. G. Craig Co. Inc., *Newscarrier*, Donnacona, 317 rolls newsprint.

ALBANY IMPORTS

WEEK ENDING OCTOBER 16, 1937

Johaneson Wales & Sparre, Inc., *Karpfanger*, Sundsvall, 3,955 bls. sulphite, 770 tons.
Johaneson Wales & Sparre, Inc., *Karpfanger*, Sundsvall, 1,000 bls. chemical pulp, 200 tons.
Johaneson Wales & Sparre, Inc., *Karpfanger*, Sundsvall, 125 bls. sulphate, 25 tons.
Perkins Goodwin & Co., *Karpfanger*, Sundsvall, 3,000 bls. sulphate, 500 tons.
Perkins Goodwin & Co., *Karpfanger*, Munksund, 3,000 bls. sulphate, 500 tons.
Bulkley Dunton Pulp Co. Inc., *Karpfanger*, ——, 1,000 bls. sulphite, 200 tons.

PORTLAND IMPORTS

WEEK ENDING OCTOBER 16, 1937

Johaneson Wales & Sparre, Inc., *Karpfanger*, Sundsvall, 1,800 bls. sulphite, 300 tons.
J. Andersen & Co., *Karpfanger*, Sundsvall, 1,200 bls. sulphate, 200 tons.
J. Andersen & Co., *Karpfanger*, Munksund, 1,500 bls. sulphate, 250 tons.
——, *Karpfanger*, Hernosand, 11,910 bls. sulphate.
Johaneson Wales & Sparre, Inc., *Karpfanger*, Obbola, 1,400 bls. sulphate, 200 tons.

BOSTON IMPORTS

WEEK ENDING OCTOBER 16, 1937

——, *Excalibur*, Alexandria, 76 bls. rags.
E. J. Keller Co. Inc., *Excalibur*, ——, 349 bls. old garments, 73 bls. rags.
E. J. Keller Co. Inc., *Black Osprey*, ——, 45 bls. bagging.
Guaranty Trust Co., *Birmania*, Trieste, 475 bls. sulphite pulp.
——, *Birmania*, Trieste, 450 bls. wood pulp.
Gottesman & Co. Inc., *Toronto*, Sweden, 1,250 bls. sulphite.
Price & Pierce, Ltd., *Toronto*, Sweden, 300 bls. unbleached sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING OCTOBER 16, 1937

E. J. Keller Co. Inc., *Black Gull*, ——, 645 bls. rags.
Castle & Overton, Inc., *Black Gull*, Rotterdam, 245 bls. rags.
J. M. Hagy Waste Works, *Black Gull*, Antwerp, 22 bls. rags.
——, *Black Gull*, Antwerp, 112 bls. rags.
Castle & Overton, Inc., *Collamer*, Havre, 92 bls. rags.
J. T. Flannery Co., Inc., *Collamer*, Harve, 384 bls. rags.
Castle & Overton, Inc., *Collamer*, St. Nazaire, 54 bls. rags.
Castle & Overton, Inc., *Collamer*, Bordeaux, 614 bls. rags.
E. J. Keller Co. Inc., *Collamer*, ——, 863 bls. rags.
E. J. Keller Co. Inc., *Anna Maersk*, ——, 250 bls. rags.
S. Shapiro & Sons, *Anna Maersk*, Kobe, 10 bls. thread waste.
Union Waste Co., *Anna Maersk*, Kobe, 10 bls. rags.

BALTIMORE IMPORTS

WEEK ENDING OCTOBER 16, 1937

——, *Kosei Maru*, Kobe, 245 bls. rags.
Castle & Overton, Inc., *Scanyork*, Wiborg, 1,083 bls. wood pulp, 216 tons.
Jay Madden Corp., *Scanyork*, Kotka, 591 rolls newsprint.
F. H. Shallus, *Scanyork*, Kotka, 149 rolls newsprint.
Congoleum Nairn Co., *Collamer*, Havre, 461 bls. rags.
Congoleum Nairn Co., *Collamer*, Bordeaux, 374 bls. rags.
Parsons & Whittemore, Inc., *City of Baltimore*, ——, 366 bls. wood pulp.
Price & Pierce, Ltd., *Sagoporack*, ——, 3,000 bls. unbleached mechanical pulp.
Price & Pierce, Ltd., *Sagoporack*, ——, 150 bls. unbleached sulphate.

NEWPORT NEWS IMPORTS

WEEK ENDING OCTOBER 16, 1937

Lagerloef Trading Co., *Scanyork*, Helsingfors, 1,068 bls. sulphite, 175 tons.
Lagerloef Trading Co., *Scanyork*, Helsingfors, 1,500 bls. sulphate, 300 tons.
Lagerloef Trading Co., *Scanyork*, Wiborg, 3,204 bls. sulphite, 635 tons.
Lagerloef Trading Co., *Scanyork*, Wiborg, 260 bls. sulphite, 52 tons.
Castle & Overton, Inc., *Scanyork*, Wiborg, 2,876 bls. wood pulp, 572 tons.

NORFOLK IMPORTS

WEEK ENDING OCTOBER 16, 1937

N. Y. Trust Co., *Collamer*, Havre, 130 bls. bagging.

MONTREAL IMPORTS

WEEK ENDING OCTOBER 16, 1937

Gottesman & Co. Inc., *Idefjord*, Sweden, 4,750 bls. sulphite.
Gottesman & Co. Inc., *Norefjord*, Sweden, 21,170 bls. sulphite.

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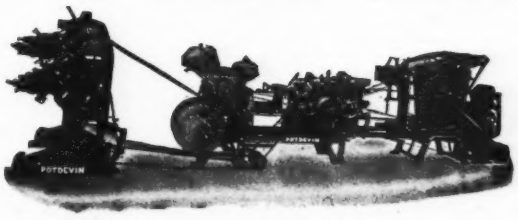

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New York Market Review

Office of the PAPER TRADE JOURNAL
Wednesday, October 20, 1937.

The wholesale paper markets report a continuation of the lull in industrial activity which is being experienced in many lines. The prevailing opinion is that the current situation will be over soon and an improvement in demand should set in shortly. Although the sales volume of many grades of paper continues below expectations, moderate activity prevails in the paper markets. Prices are firm and unchanged from the quotations of last week.

The demand for newsprint continues active, with the normal volume of shipments moving under contract.

Book papers are reported to be in moderate demand. The sales volume of bond and fine papers in general, is stated to be slightly less for the current week.

The demand for kraft papers is slightly improved for the current week. Prices continue firm and a pick-up in demand is expected within a short time.

The box board market continues to report demand as below seasonal. Sales volume is moderate and prices remain at about the same level as the preceding week.

Chemical Pulp

The chemical pulp market is moderately active. The new offerings of the imported grades are stated to be rather limited. Prices are slightly lower for the current week.

Mechanical Pulp

The demand for mechanical pulp continues on the level of the preceding week. Prices are firm and no changes are reported for the current week.

Old Rope and Bagging

The old rope and bagging market reports demand as slightly less for the current week. Prices for foreign bagging are slightly higher, while domestic bagging is unchanged. The prices of foreign and domestic manila rope and jute threads, are slightly lower for the week.

Rags

The demand for domestic rags continues moderately active. Prices for new rags are slightly lower. Roofing rags are less active than during the preceding week and current prices show further declines.

Waste Paper

The waste paper market reports demand as moderate. Prices on many grades are slightly lower for the week. The quotations on the higher grades hold firm, while the low grades show slight declines from last week.

Twines

The twine market reports little change in either demand or prices. Demand continues moderate, with prices, in general, firm and unchanged from last week.

New Screen Shake Developed by Shartles

Experimental work on a revolutionary type of screen shake designed to eliminate the bad features of conventional equipment is now being conducted by Shartle Brothers of Middletown, Ohio. Results accomplished are extremely satisfactory, according to word received from the company.

The new type shake is based on an entirely new principle and does away entirely with the usual knockers and eccentrics. The Company claims it enables the mill to vary at will not only the speed of operation but also the amount of throw. Screen life is also greatly lengthened by use of the new equipment, it is said.

Shartle Brothers plan to issue an announcement in bulletin form describing the new shake in detail if remaining tests meet the approval of the engineering department.

Takes Over Suvant Stiffness Tester

The Taber Instrument Company, North Tonawanda, New York, has taken over the manufacture and sale of the "Suvant" stiffness tester, widely used in the United States, Canada and foreign countries for determining the rigidity of paper and light board.

The "Suvant" was formerly handled by the Wilson Mechanical Instrument Company, New York City, who were licensees under Smith-Taber patents.

Mr. Taber, the president of the company, announces the Suvant will be continued along with the new Taber V-5 Precision Stiffness Gauge, the latter being calibrated in metric gram-centimeter units. The latter instrument requires no electrical connections and its greater sensitivity makes it especially desirable for testing fine papers.

Hugh J. Chisholm Made a Director

Hugh J. Chisholm, president of the Oxford Paper Company, has been made a director of the Grace National Bank of New York City.

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Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, October 20, 1937.

BLANC FIXE—The blanc fixe market continues steady. Prices are firm and unchanged from the prices of the preceding week. Quotations of pulp range at from $42.50 to $45 per ton, in bulk, while the powder is quoted at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—The demand for bleaching powder continues steady. Prices are unchanged for the current week, with quotations at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The casein market is steady. Prices are firm. Domestic standard ground casein is quoted at 14 cents per pound; domestic finely ground casein is offered at 15 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA—The demand for caustic soda continues steady. Quotations for solid caustic soda range at from $2.10 to $2.30. The flake and ground is offered at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—The china clay market is active. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is offered at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, all prices at mines.

CHLORINE—The chlorine market is active. Prices are firm and prices unchanged for the current week. Chlorine is quoted at $2.15 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market maintains a steady tone. Prices are slightly lower for the week. Paper making rosin is offered at $7.50, and wood rosin at $7.47 per 280 pounds, gross weight, in barrels at Savannah. Seventy per cent rosin size is quoted at $3.51 per 100 pounds, in tank cars, f.o.b., shipping point.

SALT CAKE—The demand for salt cake continues steady. Quotations range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12, f.o.b., shipping point. Imported salt cake is offered at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—The soda ash market continues steady, with a good demand from paper mills. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The demand for starch continues about on the level of the preceding week, with the expectation of a slight change in prices soon. Paper making starch is quoted at $3.45 per 100 pounds, in bags, and at $3.70 per 100 pounds in barrels, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—The sulphate of alumina market is unchanged for the current week. Prices are firm. The commercial grades are quoted at from $1.25 to $1.60; iron free at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The sulphur market is steady. Prices are firm. Annual contracts are quoted at $18 per long ton, f.o.b., cars at mines. Spot and nearby car lots are quoted at $21 per ton, all prices in car lots.

TALC—The demand for talc continues steady. Prices are firm. Quotations on domestic talc range at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

Market Quotations

Paper

Tissues—Per Ream—

White No. 1	1.10	@	—
White No. 1 M. G.	1.07½	@	—
White No. 1½	.77½	@	—
White No. 2	.75	@	—
Anti-Tarnish M. G.	.77½	@	—
Colored	.90	@	—
Kraft	.77½	@	—
Manila	.75	@	—
Unbleached Toilet.	2.90	@	3.30
Bleached Toilet	3.94	@	5.26

Paper Towels—

Unbleached	2.10	@	3.35
Bleached	3.30	@	3.70

Manila—

No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00

Fibre Papers—

No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75

(Delivered New York)

News, per ton—

Roll, contract	42.50	@	—
Sheets	47.50	@	—

Kraft—

No. 1 Northern	5.25	@	5.75
Standard	5.00	@	—
Southern	4.50	@	—
Machine glazed, plain, striped	5.00	@	—

Boards, per ton—

Chip	40.00	@	—
News	37.50	@	—
Sgl. Mla. Ll. Chip	52.50	@	—
Jute Lined Chip	52.50	@	—
White Pat. Coated	65.00	@	67.50
Kraft Liners	55.00	@	—
Binders Boards	75.00	@	80.00

The following are representative of distributors' resale prices:—

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1.	$41.40@$48.50		$42.55@$50.00
100% Rag	32.80@ 38.50		33.95@ 39.75
85% Rag	.....		32.20@ 37.75
75% Rag	24.75@ 29.00		25.90@ 30.50
65% Rag	21.65@ 26.25		22.80@ 27.75
50% Rag	18.70@ 22.75		19.90@ 24.25
25% Rag	15.80@ 19.25		16.95@ 20.75

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds	Ledgers
No. 1.	$9.35@$11.50	$10.55@$12.75
No. 2.	8.50@ 10.25	9.65@ 11.75
No. 4.	7.60@ 9.25	8.80@ 10.75

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated	$12.45	@	$14.25
No. 2 Glossy Coated	10.80	@	12.25
No. 3 Glossy Coated	9.65	@	11.00
No. 4 Glossy Coated	9.05	@	10.50
No. 1 Antique (watermarked)	9.05	@	10.50
No. 2 Offset	8.35	@	9.50
A Grade E. F.	8.20	@	9.50
A Grade S. & S. C.	8.45	@	9.75
B Grade E. F.	7.60	@	8.75
B Grade S. & S. C.	7.85	@	9.00
C Grade E. F.	7.30	@	8.50
C Grade S. & S. C.	7.55	@	8.75
D Grade E. F.	7.00	@	8.25
D Grade S. & S. C.	7.25	@	8.50

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—

Moist	35.00	@	36.00
Dry	40.00	@	42.00

(Delivered)

No. 1 Domestic and Canadian	36.00	@	37.50

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—

Prime Bleached Sulphite	3.50	@	4.65
Prime Qualities—Easy-Bleaching Sulphite	3.25	@	3.75
Strong Unbleached Sulphite	3.00	@	3.65

(On Dock, Atlantic Ports)

Kraft Bleached	4.00	@	4.75
Kraft Light & Strong	3.00	@	3.75
Kraft No. 1	2.90	@	3.65
Kraft No. 2	2.50	@	2.75

(F.o.b. Pulp Mill)

Kraft Domestic	2.00	@	3.00

(Delivered)

Soda Bleached	3.25	@	—

Add 60 cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—New White, No. 1	8.25	@	8.75
Silesias, No. 1	6.63	@	6.88
New Unbleached	8.75	@	9.00
Blue Overall	6.75	@	7.00
Fancy	3.50	@	3.75
Washables	2.50	@	2.75
Mixed Khaki Cuttings	4.25	@	4.50
O. D. Khaki Cuttings	4.75	@	5.00

Old Rags

White, No. 1—Repacked	3.75	@	4.25
Miscellaneous	3.00	@	3.25
White, No. 2—Repacked	2.60	@	2.85
Miscellaneous	2.00	@	2.25
Thirds and Blues—Repacked	2.00	@	2.25
Miscellaneous	1.75	@	2.00
Roofing Rags—No. 1	1.45	@	1.50
No. 2	1.15	@	1.25
No. 3 (bagging)	.80	@	.90
No. 4	.80	@	.90
No. 5A	.65	@	.75

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	5.50

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STUFF CHESTS
BLOW PIT
CHEMICAL
ACID
PULP STORAGE
LEAD LINED

ESTABLISHED 1854
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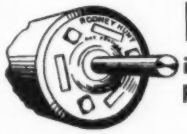

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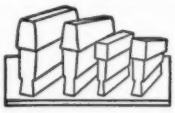

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Will Bring Results

No. 4 White Linens	2.25	@	3.25
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	3.00
No. 4 White Cotton	1.90	@	2.20
Extra Light Prints	2.00	@	2.40
Ord. Light Prints	1.75	@	2.15
Med. Light Prints	1.55	@	1.95
Dutch Blue Cottons	2.25	@	2.50
French Blue Linens	3.00	@	—
Checks and Blues	2.00	@	—
Linsey Garments	2.10	@	2.20
Dark Cottons	1.75	@	1.85
Old Shopperies	1.60	@	—
New Shopperies	1.60	@	—
French Blues	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.40	@	2.60
Domestic	2.25	@	2.35
Wool Tares, light	1.75	@	1.85
Wool Tares, heavy	2.10	@	2.15
Bright Bagging	1.60	@	1.70
Manila Rope—			
Foreign	3.50	@	3.75
Domestic	3.75	@	4.00
Jute Threads	2.75	@	3.00
Sisal Strings	2.35	@	2.45
Mixed Strings	Nominal		

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1	2.60	@	2.70
Hard White No. 2	2.40	@	2.50
Soft White No. 1	2.30	@	2.40
Flat Stock—			
Stitchless	1.10	@	1.15
Overissue Mag	1.10		1.15
Solid Flat Book	.80	@	.90
Crumbled No. 1	.60	@	.70
Ledger Stock	1.55	@	1.60
New B. B. Chips	.35	@	.40
Manila—			
New Env. Cut	2.15	@	2.25
New Cuttings	1.65	@	1.75
Old Kraft Machine—			
Compressed bales	1.15	@	1.25
News—			
No. 1 White News	1.40	@	1.50
Strictly Overissue	.60	@	.70
Strictly Folded	.40	@	.45
No. 1 Mixed Paper	.35	@	.35

Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—			
India	.16	@	.17½
White Hemp	.17	@	.20½
India Compress	.16½	@	.17
Fine Polished—			
Fine India	.22	@	.28
Unpolished—			
Box	.12½	@	.15½
Paper Makers	.11½	@	.13¾
Tube Rope	.12½	@	.15¼
Wall Paper	.13½	@	.14¼
Wrapping	.17	@	.21
Soft Fiber Rope	.14¾	@	.15¾

(Hard Fibre)

Medium Java	.13½	@	.14
Mex. Sisal	.12	@	.12½
Manila	.22	@	.29½
Domestic	4.00	@	—
Transmission Rope	2.00	@	2.25
Soft Jute Ropes	2.25	@	2.50
Jute Carpet Threads	1.75	@	2.00
Gunny No. 1			
Foreign	2.50	@	2.60
Domestic	2.10	@	2.25
Bleachery Burlap	4.00	@	4.25
Scrap Burlap—			
Foreign	2.25	@	2.40
Domestic	1.75	@	1.85
Scrap Sisal	2.25	@	2.30
Scrap Sisal for Shredding	2.65	@	2.70
Wool Tares, heavy	—	@	2.25
New Burlap Cuttings	2.45	@	3.00
Aust. wool pouches	3.60	@	3.75
Heavy bailing bagging	2.50	@	2.70
Paper Mill Bagging	1.70	@	1.75
Bagging No. 2	1.00	@	1.10

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.03½	@	.03¾
New White No. 1	.08	@	.08¼
New White No. 2	.06	@	.06¼
New Light Flannelettes	—	@	.06½
Silesias No.	—	@	.06½
New Black Silesias	.04¼	@	.04½
Soft Unbleached	.08½	@	.08¾
Blue Cheviot	.07¼	@	.07½
Fancy	.03¾	@	.04
Washable	.03	@	.03¼
Cottons—According to grades—			
Blue Overalls	.07	@	.07¼
New Black, soft	.04¼	@	.04½
Khaki Cuttings	.04½	@	.04¾
O. D. Khaki	.04¾	@	.05
Corduroy	.03¼	@	.03¼
New Canvas	.07¾	@	.08¼
B.V.D. Cuttings	.08¼	@	.09

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62¼
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.27	@	1.28
No. 2	1.22	@	1.23
No. 3	1.19	@	1.20

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.50	@	1.60
Dutch Blues	2.85	@	3.00
New Checks and Blues	2.85	@	3.00
Old Fustians	2.75	@	2.95
Old Linsey Garments	2.00	@	2.15
New Silesias	6.50	@	7.00

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.07½	@	.08
New White, No. 2	.04½	@	.05
Light Silesias	.05½	@	—
Silesias, No. 1	—	@	.05½
Black Silesias, soft	.03	@	.03½
New Unbleached	.07½	@	.08
Washable, No. 1	.02	@	.02¼
Blue Overall	.04½	@	.05
Cottons—According to grades—			
Washable, No. 2	—	@	.01¾
New Blue	.01½	@	.01¾
Fancy Percales	—	@	.03½
New Black Soft	.03	@	.03½
New Light Seconds	—	@	.05½
New Dark Seconds	1.25	@	1.50
Khaki Cuttings—			
No. 1 O. D.	.03½	@	.04
No. 2 Mixed	—	@	.02¾
Corduroy	.02¾	@	.03
New Canvas	.06	@	.06½
New Black Mixed	.02	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.25
Miscellaneous	2.50	@	2.75
Thirds and Blues—			
Miscellaneous	2.00	@	2.25
Repacked	2.25	@	2.50
Black Stockings (Export)	4.00	@	4.50
Roofing Stock—			
Foreign No. 1	1.50	@	1.75
Domestic No. 1	1.50	@	1.70
Domestic No. 2	1.30	@	1.40
Roofing Bagging	—	@	1.25

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.80	@	2.00
Domestic	2.00	@	2.25
Manila Rope	3.75	@	4.00
Sisal Rope	2.00	@	2.25
Mixed Rope	1.00	@	1.10
Scrap—			
No. 1	1.50	@	1.75
No. 2	1.00	@	1.25
Wool Tares, heavy	3.25	@	3.50
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.55	@	2.75
No. 2 Hard White	2.40	@	2.55
No. 1 Soft White	2.25	@	2.30
No. 2 Soft White	1.50	@	1.75
No. 1 Mixed	.80	@	.90
Solid Ledger Stock	1.75	@	1.85
Ledger Stock, white	1.50	@	1.60
Ledger Stock, colored	1.35	@	1.45
No. 1 Books, heavy	1.05	@	1.10
Manila Cuttings	1.75	@	1.85
Print Manila	.50	@	.55
Container Manila	.45	@	.50
Kraft Paper	1.15	@	1.20
No. 1 Mixed Paper	.35	@	.45
Straw Board Chip	.40	@	.45
Binders Board Chip	.40	@	.45
Corrugated Board	.50	@	.55
Overissue News	.60	@	.65
Old Newspapers	.40	@	.45

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.40
No. 1 Soft White	1.85	@	2.15
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ldgers	.85	@	.90
No. 1 Books, heavy	1.00	@	1.10
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.60	@	1.70
Manila Env. Cuttings, extra quality	2.20	@	2.30
No. 1 Old Manila	.95	@	1.00
White Blank News	1.30	@	1.40
No. 1 Kraft	1.45	@	1.50
Mixed Papers	.27½	@	.30
Print Manila	.60	@	.65
Container Manilas	.27½	@	—
Old Newspapers	.32½	@	.35
Overissue News	.45	@	.50
Box Board Chips	.35	@	.40
Corrugated Boxes	.35	@	.40
Kraft corrugated boxes	—	@	1.00
Screening Wrappers	.55	@	.60

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	—	@	3.75

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	3.30	@	3.40
No. 1 Hard White	2.60	@	2.70
No. 1 Soft White	2.10	@	2.15
Ledger & Writings	1.40	@	1.50
Solid Books	1.25	@	1.30
Blanks	1.05	@	1.20
Krafts	1.00	@	1.25
New Kraft Cuts	1.80	@	2.00
Manila Env. Cuts	2.20	@	2.35
Ex. No. 1 Manila	2.20	@	2.35
Print Manila	1.70	@	1.80
Overissue News	.40	@	.50
Old Newspapers—			
No. 1 Folded News	.35	@	.45
No. 1 Mixed Paper	.35	@	.45
Roofing Stocks—			
No. 1	2.00	@	2.25
No. 2	1.85	@	2.00

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.35½	@	.36½
No. 1 Tints	.36½	@	.37½
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	—	@	.1550
No. 4 Tints	.16	@	.1650
No. 5 Bond—White	11.35	@	—
No. 5 Bond—Tints	12.35	@	—
No. 5 Bond—Golden Rod	13.35	@	—
No. 5 Ledger—White	.1185	@	—
No. 5 Ledger—Tints	.1285	@	—
No. 6 Bond—White	10.75	@	—
No. 6 Bond—Tints	11.25	@	—
No. 6 Bond—Golden Rod	12.75	@	—
No. 7 Bond—White	9.10	@	—
No. 7 Bond—Tints	9.60	@	—
No. 7 Bond—Golden Rod	11.10	@	—
Book—			
No. 1 M. F.	7.10	@	7.35
No. 2 M. F.	6.85	@	7.20
No. 3 M. F.	5.60	@	6.20
No. 1 S. C.	7.60	@	7.85
No. 2 S. C.	7.10	@	7.35
No. 3 S. C.	6.10	@	6.35
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.00	@	—
No. 3 Coated and Litho	9.50	@	10.00
Coated tinted	13.00	@	13.50
Wrapping—delivered—			
Rag Brown	4.85	@	5.55
White Wrap	4.00	@	—
"B" Manila	4.90	@	6.25
No. 1 Manila	5.50	@	7.00
Fiber	5.50	@	—
Kraft, No. 2	5.50	@	—

(F. o. b. Cars, Toronto)

News, per ton—			
Rolls (contract)	38.50	@	—
Sheets	45.50	@	—

Pulp

Ground wood	32.00	@	—
Unbleached Sulphite	59.00	@	—
Book (Class 1)	71.00	@	—
Writing (Class 2)	72.00	@	—
Select (Class 3)	73.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.50	@	—
Soft White	2.15	@	—
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.00	@	—
Light and Crumpled Book Stock	.85	@	—
Ledgers and Writings	1.20	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.65	@	—
Kraft	1.00	@	1.70
News and Scrap—			
Strictly Overissue	.65	@	—
Strictly Folded	.60	@	—
No. 1 Mixed Paper	.50	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09	@	.09¼
Fancy Shirt Cuttings	.03½	@	.03¾